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REPORT OF THE SECTION

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1839
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APPOINTED TO ENQUIRE INTO

THE PRESENT STATE

OF

VACCINATION,

AS

READ AT THE ANNIVERSARY MEETING,

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

HELD AT LIVERPOOL, JULY 25, 1839,

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PRELIMINARY REMARKS.

THE subject committed to our care is one of deep importance to the safety and well-being of the community. We have entered upon it with an earnest and anxious desire to discover truth, and

to lay it before our brethren in the most simple and perspicuous manner. The number and variety of the questions involved in the investigation increased the difficulties of our task; these we have endeavoured to surmount by fixing our attention upon the great and leading features, and thus to find a place where all the subordinate parts might take their station without disorder. The diversified character of our materials, and their intimate relations with each other, rendered this partition and separation both perplexing and laborious. We dare not hope that we have completely realised our own wishes, but our brethren, we trust, will believe that our endeavours have been both diligent and sincere. It will be seen, as we advance, that some of the information about to be communicated, is highly interesting and valuable. It has happily enabled us to carry out the arrangement with greater precision than could otherwise have been attained. This benefit, considerable though it be, is small when compared with the practical results that flow from it.

The first division of the Report embraces those points that have received what we take to be a satisfactory demonstration. The other divisions, all more or less dependent upon it, have been drawn up from authentic documents, and set forth the past and present experience of many of the most respectable professional gentlemen in this country, in a faithful and condensed form; this at least has been our aim. It must, at the same time, be admitted that the testimony has not always accorded. In arriving at conclusions we have been compelled to

weigh and balance evidence; but as the facts which have guided us are fairly stated, our opinions can at once be brought to the test, and of course will avail no more than as they appear to be conformable to the truth. With this admission we desire it to be understood that nothing has been introduced of an hypothetical or speculative nature; nothing has been kept back unfavourable to the cause of vaccination; neither has any thing been withheld that was calculated to produce an impression of a different kind. While arguing either for one side of the question or the other, we have studied to confine ourselves within the limits of a strict impartiality. At the outset we would claim credit for this intention, the nature of the evidence being occasionally of a jarring and contradictory description; to sift and examine that evidence made up no trifling part of our duty. It would have been gratifying had this necessity not existed; but to have shrunk from the difficulties arising out of it, would have rendered the present undertaking equally inconclusive and unsatisfactory. We have endeavoured on the one hand to moderate and regulate public expectation where needful; and on the other to prevent undue apprehensions from damping confidence in a practice that has already been fraught with such wonderous benefit to mankind; and when perfectly understood and carefully followed, we humbly hope may still be permitted greatly to bless our race.

Valuable information, from whatever source derived, has not been overlooked; but we have ever borne in mind that after having accomplished the most important part of our labour, the next was to

confine our enquiries, as much as with propriety could be done, to the present state of vaccination in these kingdoms. To have detailed, even in the briefest manner, the opinions that have been published in other countries, would have swelled this Report to a very needless magnitude. These opinions are also often of a contradictory nature, the experiments by which they are supported are not less so, and we have had no inclination to enter on this disputed ground, because we flatter ourselves that the sources of these contrarities are likely to be removed.

The gentlemen who have favoured us with their returns, may rest assured that they have been most carefully scanned; and though every individual name has not been mentioned, all will perceive how much the value of our Report depends upon their respective communications. We will only add, that from the method of conducting vaccination in Great Britain, accurate registers are not in general kept, and it has therefore not been possible to construct such tables as could have been desired.

Having premised these observations, we shall now state the order in which we mean to arrange the different heads or sections. The first will treat of the affinities between human small-pox and cow small-pox. The second will contain what we deem essential to render vaccination correct, with some observations on the impediments to that practice. We will then proceed to consider the protecting power of vaccination. Our fourth section will comprise remarks on small-pox after small-pox; which will be followed by a brief examination of the

question of re-vaccination. Lastly, we shall enquire into the state of the population generally, both with regard to small-pox and vaccination ; the means at present employed for the dissemination of the former, with suggestions for restraining it, and promoting genuine effectual vaccination.

AFFINITIES BETWEEN HUMAN SMALL-POX AND COW SMALL-POX.

In pursuing this investigation, we have especially directed our attention to the nature of the *variolæ vaccinæ*, their origin, their history, their affinities with the *variolæ* of the human species, and the foundation on which confidence may rest as to their prophylactic virtue. This portion of the subject may well occupy the attention of the Association, as upon a due understanding of it, every thing that is valuable in the practice of vaccination depends. Formerly it was supposed to be obscured by difficulties and uncertainties ; now we have the satisfaction of being able to say that such difficulties are removed, and that the great problem respecting the nature of the security afforded to man by the communication of the vaccine disease, is solved. We cannot refer to this momentous event without paying a passing tribute to the genius and discrimination of the magnanimous and most distinguished author of vaccination. He called the disease the *Variolæ Vaccinæ*, and good reason he had for this most correct and pregnant designation. Many of his contemporaries derided it, but he wisely adhered to his own views, remarking, with admirable sagacity, that this very appellation contained in it the germs

of a theory which future observations would illustrate and verify. That verification has been obtained; and we deem it of so much importance, that we place it in the most conspicuous part of our Report, well assured that it influences every question that can arise respecting the object of our researches.

Let us, therefore, recur to the idea involved in this designation. It implies that one genus of the inferior animals is liable to a disease of a kindred nature with that which attacks man, the latter, for the most part, being pestilential and fatal; the former often mild, and scarcely pestilential at all. The practice of inoculation had long been in use to diminish the mortality of human *variolæ*, and it had been ascertained, by casual observation, that an affection derived from the cow, protected from subsequent attacks of that disease. This, and other facts, led Dr. Jenner to conclude that the protecting power arose from the impregnation of the constitution with a mild species of small-pox instead of the malignant and virulent sort, which is for the most part propagated from man to man, whether naturally or by inoculation. This idea, which he very early took up, guided him through all his investigations, and led him at last to the great result of his labours, namely, the successful transmission, by inoculation, of the mild and safe affection from the inferior animals, instead of the contagious and malignant disease which for so long a period had devastated mankind. His confidence in this practice arose from his unalterable conviction that these two disorders, how different soever they might be in some particulars, were in reality identical.

These conclusions, resting upon a very wide induction, drawn both from the history of human small-pox, as well as from accurate observation of small-pox among cattle, were published by him in every possible form, as his reasons for recommending the inoculation with *cow small-pox* instead of *human small-pox;* but his doctrines were disregarded and contemned, and the majority, we believe, of the public, as well as of the profession, to this hour imagine that the benefit derivable is not because these diseases are alike in essential properties, but because they are in all respects dissimilar and opposed the one to the other—the disease arising from the cow being imagined to be an antidote, not a safe and effectual substitute for a more malignant form.

Things continued in this state nearly up to the time of his death; and the controversy which sprang from his discovery had very little reference to this fundamental part of his doctrine, but consisted rather in assertions and counter-assertions respecting the alleged virtue of the disease derived from the cow. Some of those who have followed Dr. Jenner, have laboured to bring back the question to its proper basis, and to prove that the opinions which he promulgated were capable of demonstration, both from the medical and literary history of *human small-pox* and *cow small-pox*. The light thrown upon the whole subject by these enquiries respecting the diseases of the inferior animals is very striking and peculiar, and they must be specially brought forward in this place, in order to enable us to complete that chain of evidence which leads us to our great conclusion.

We will begin, therefore, by stating that it has been shown, by unquestionable evidence, that cattle and other animals have for centuries been known to be affected with small-pox or *variola*. This latter appellation has unhesitatingly been given to the disease by every different writer who has seen it; by Doctor Layard, in England; and, long before him, by Fracastorius, Lancisi, Lanzoni, Ramazzini, and others, in Italy. We believe that these facts were unknown to Dr. Jenner; but, be this as it may, they give an authority to the language employed by him, corroborated as it will be by still more explicit evidence.

The disease described by the authors above named, was of a malignant character, and destroyed the cattle almost as extensively as small-pox did the human race. It is not known how often it may have raged in England, but it is certain that it was introduced into this country in 1745, and again in 1770, and appeared among the horned cattle, with more or less violence, so late as 1780. At this time Dr. Jenner was carrying on his investigations; and it was in this very year that Dr. Layard published his second paper in the *Transactions of the Royal Society*, in which, among other things, he mentions that inoculation from cow to cow was successfully practised to mitigate the severity of the disease. This chain of evidence, very briefly and imperfectly stated, leads however to the conclusion that it was the remains of this violent epizootic that Dr. Jenner found in Gloucestershire, and which being occasionally transferred to the milkers, secured them from subsequent small-pox. It is a strong con-

firmation of this, that the mild form of the disease had been mentioned by Vicq d'Azyr as occurring at the same period among the cattle of Picardy. He says that some of them had the neck only covered with pustules (*boutons*), and that when the disease was thus partial, the termination was usually favourable.

We have a curious collateral illustration of the malignant character of this distemper in the speech delivered by his Majesty, George the Third, at the opening of the Parliament on the ninth of January, in the year 1770. "It is with much concern," said the King, "that I find myself obliged to open this Session of Parliament with acquainting you that the distemper among the horned cattle has lately broken out in this kingdom, notwithstanding every precaution that could be used for preventing the infection from foreign parts. Upon the first notice of its actual appearance, my next attention was to endeavour to stop its farther progress; and as the success of those endeavours must in all probability have been entirely defeated by any the least degree of delay in the application of them, I thought it absolutely necessary, with the advice of my Privy Council, to give immediate directions for every step to be taken that appeared most capable of checking the instant danger of the spreading of the infection, until I could have an opportunity of consulting my Parliament upon some more permanent measures for securing us against so great a calamity, and to your immediate and serious consideration I earnestly recommend this very important subject." The answer of the Lords was, as usual, an echo to this

part of the speech; but that of the Commons corroborates a fact which we have ascertained from other sources, namely, the previous existence of the disease in the country, as they express their regret that that alarming distemper had *again* broken out in some parts of the kingdom.

The bitter and sarcastic Junius thought fit to make this calamity the subject of his satire: in his letter to the Duke of Grafton, he says, "while the whole kingdom was agitated with anxious expectation upon one great point, you meanly evaded the question, and instead of the explicit firmness and decision of a king, gave us nothing but the misery of a ruined grazier, and the whining piety of a methodist." He adds in a note, "there was something wonderfully pathetic in the mention of the horned cattle." Could this bold and unfeeling writer have caught the slightest glimpse of the wonderful consequences arising from this disease "of the horned cattle,"—could he have seen, in the most remote degree, its affinity with a like distemper in man, (and history and experience were not silent on this point, even in his day,)—he might have perceived that the sufferings as well as the safety of his fellow creatures were deeply involved in the question. The party politics of the hour might then for a moment have lost their influence, and a nobler sentiment have taken possession of his soul. But notwithstanding the sarcasms of Junius, his Majesty recurred to the subject on the opening of the ensuing session, Tuesday, November the 13th, in the same year. Both Houses of Parliament in their addresses alluded to it, and talked of "the fatal contagion which has of late appeared in some

of the distant parts of Europe." It was not to be expected that our Senators should be accurate medical historians; but we know, from the clearest evidence, that the appearance of this disease had not been of recent date, as we have descriptions of it hundreds of years before.

Whether the great increase of mortality from small-pox which occurred during the latter part of the last century had any thing to do with this epizootic, we cannot tell: the coincidence, nevertheless, deserves notice. From the year 1731 to 1772, the proportion of deaths from small-pox compared with those that arose from all other causes, was as eighty-nine in a thousand; whereas, from 1770 to 1800, they were as ninety-six in a thousand. This increase has been attributed to the general practice of small-pox inoculation during the latter period. Such may have been the case; but still it is true that when the cattle were scourged by the variolous disease, mankind were in like manner great sufferers. One of our correspondents, Mr. Bree, of Stowmarket, makes an incidental remark applicable to this point. "During the prevalence of small-pox in this neighbourhood," he observes, "several dairies became affected with cow-pox; which supports the opinion of the identity of the two diseases, the latter being probably modified by being developed in the cow."

The history of these epizootics shows also that horses as well as cows are liable to this affection. This interesting fact illustrates and explains one of the most difficult and perplexing events in the practice of vaccination. It was known that a disease

from the horse was sometimes communicated to the cow by men employed in dressing the heels of the one, and afterwards milking the other. This disease was supposed to be what is vulgarly called *the grease*, and was imagined by Dr. Jenner, in the outset of his enquiry, to be the origin of small-pox. This idea he lived to correct; but the prejudices it excited, and the erroneous views to which it gave birth, have unhappily been perpetuated. It is ascertained that the horse is liable to a vesicular disease of a variolous nature as well as the cow; and that lymph taken from the horse and inserted into man, will produce an affection in all respects like that derived from the cow, and equally protective. The error consisted in believing that this affection was *the grease*, and that it required to be transmitted through the cow to give it efficacy. A misapprehension of this kind may well be excused in the infancy of so complicated an investigation. The disease appearing for the most part on the thin skin of the heels of the horse, and the traditions among the farriers in the country, leading to the mistake. We now know that the vesicle may appear on other parts of the animal's body; and that the horse as well as the cow has in different ages and in different countries suffered both from the mild and malignant *variolæ*.

These variolous epizootics may be traced in the most authentic medical records for several hundred years, and the connexion between them and pestilences, which have ravaged both man and the inferior animals throughout the ages of the most remote antiquity, may be discerned with much

greater accuracy than at first might be imagined. It is likewise worthy of remark, that the countries where the disease has of late years been found, either on cows or horses, are those where it has formerly been known to have existed among them in its most virulent form. But its ravages are not confined to one region of the earth; it has been discovered in the valleys of England, on the mountains of the Andes, on the elevated ranges of the Himalayan chain, in the plains of Lombardy, and the green pastures of Holland and Holstein. What it was formerly in the days of Lancisi and Lanzoni in Europe, it is at this moment in Asia.

The cows in Bengal have long been affected with this complaint; and it is a point not to be overlooked on this occasion, that the natives describe it by the very same terms by which they designate the *variolæ* in the human subject, namely, *bussunt, mhata,* or *gotee.* In August, 1832, Mr. Macpherson found this disease among some cows at Moidapore. The description which he has given so entirely agrees with what is recorded by Fracastorius and the other Italian writers already mentioned, that it is impossible to doubt that they were all delineating one and the same disease. We have farther to observe, that an affection of a precisely similar character has been witnessed in a dairy in Gloucestershire so late as 1825. The veterinary surgeon who saw it described it as an aggravated case of cow-pox, the whole skin from the base of the horn to the end of the tail, and to the hoofs, being covered with the disease. It destroyed the animal, and spread through all the other cows in the dairy, between

forty and fifty in number. Now, all this exactly agrees with the variolous epizootic described by Dr. Layard, in 1780, which he said "bore all the characteristic symptoms, crisis, and event, of the small-pox." We will connect this subject with the experiments conducted by Mr. Macpherson in Bengal, who observed the disease among the cows in its topical, as well as in its more malignant and pestilential form. Thus, he found two small pustules on the teats of one cow. From the crusts obtained from these pustules, he inoculated eleven children. It failed in the majority of instances, but in one it produced the true vaccine disease. Not the least impressive event in this history is yet to be mentioned. In 1837, another series of inoculations was performed with virus from diseased cows; on which occasion an eruptive complaint of the true variolous nature was produced. The same phenomena have been observed in the course of the last year at Gowalpara by Mr. Wood. In several of his cases the symptoms were so severe as to excite apprehension that the disease would terminate fatally. He was so strongly impressed with this fact, that he thought it would be better to take human small-pox rather than cow small-pox for inoculation, when the latter assumes its dangerous and fatal form.

It is thus incontestibly proved, that a severe variolous disease may be communicated from the inferior animals to man, as well as a more mild and benignant affection. The event in either case seems to depend upon the state of the disease in the animal from which the virus is taken; and had inoculations

been performed on man with lymph taken from the cattle as they were afflicted in the middle and latter part of the last century in England, we should probably have witnessed the very same results that have recently taken place in Bengal.

We have already alluded to the simultaneous existence of small-pox among men and the inferior animals in this country, and as this is a peculiarly interesting and important branch of our enquiry, we must endeavour to establish it by a few additional facts. That the pestilence was very fatal, both to the horned cattle and to the human species during a great part of the last century, admits of no dispute. The remark likewise of Mr. Bree, of Stowmarket, that the prevalence of small-pox in his neighbourhood, at the same time that the disease appeared in the dairies of Suffolk, ought to be had in remembrance while we mention that many other parts of England have lately borne witness to the same truth.

During the late epidemic the affection among the cows has certainly been more observed than at any period for many years. In Gloucestershire it has been seen by many persons, and it is from this county, we believe, that Mr. Estlin derived the lymph which he has so assiduously diffused. In Dorsetshire it has been found by Mr Fox, of Cerne Abbas, and within these few weeks by Mr. Sweeting, of Abbotsbury, both of whom have successfully propagated the affection on man. In Buckinghamshire, likewise, it prevailed extensively, and enabled Mr. Ceeley to institute some of the valuable experiments which we shall shortly notice.

We have no doubt at all that had attention been generally directed to this point, much more information might have been obtained. We are happy in being able to supply deficiencies of this kind, by a short reference to facts recently derived from other regions of the earth.

In a General Sketch of the Province of Guzerat, by A. Gibson, Esq., published in the first volume of the *Transactions of the Medical and Physical Society of Bombay*, which has just reached us, is the following passage:—"Variola, or small-pox, carries off annually many persons, particularly in the more remote and unfrequented districts, out of the line of the great roads, or at a distance from large towns. I believe that in the midland country, beginning at Surat and ending at Ahmedabad, in the whole of which range vaccination is thankfully received, and often eagerly sought after, the frequency of variola has been greatly lessened, and the results appear evident in the increase of population. *The same disease is at times very fatal among the cattle;* they become so weak and feverish as to be unable to eat in consequence of the effect of the pustular eruption on the lips, tongue, and throat."

Let us now take another quotation from a letter written by Mr. Macpherson (to whom we have already alluded), dated at Murshidabad, May 1st, 1836:—"The disease is said to make its appearance among the cows here generally about the breaking up of the rains; but no cases, so far as I have been able to ascertain, have occurred for the last two years; and I am happy to add, that very few cases of variola have been known within the

same period. From these circumstances we may infer (as I have remarked in former letters on this subject) that the unknown causes which favour the disease in the human subject, have the same tendency in the cattle; in fact, that *variola and mhata, or gotee, owe their origin to the same cause.*"

This observation is eminently deserving of consideration; and that constitution of the atmosphere which promotes the dissemination of the disease, either among men or the inferior animals, ought to be particularly watched, when it is attempted to inoculate the latter with human small-pox. We believe that many unsuccessful experiments may be ascribed to the neglect of this precaution.

Mr. Lamb, who wrote from Dacca on May 9th, 1836, and described the disease among the cattle with great accuracy, although he did not frequently observe the co-existence of human small-pox and cow small-pox, nevertheless mentions, that when the former was prevalent at Dacca, the latter appeared in one *Muhalla* and carried off fifteen or twenty cows. He attempted to inoculate the cows with human small-pox, after the manner practised by Dr. Sonderland, but without success. The virus was then inserted on the udder, and about a dozen irregular pustules made their appearance, but he was unable to produce any effect from them by repeated trials on the human subject.

We will now advert to a letter from Mr. Brown, addressed to S. Ludlow, Esq., Superintending Surgeon of Barrackpore. Mr. Brown, who was stationed at Silhet, where the variolous disease was prevalent among the cows, selected from one of

them some of the dark brown scabs scattered over the back and abdomen. These he reduced to a pulp with water, part of which he inserted into the arms of four children. In all, correct vaccine vesicles were said to have been produced, the constitutional disturbance, however, being on the eighth day more severe than usual. From this stock, the disease was propagated during two months without any suspicion as to the genuineness of the affection. After this time, children in whom the virus was inserted, were on the eighth day attacked with fever, followed by an eruption which spread over the whole body, and in one case proved fatal. Mr. Furnell, whose own child perished by the disease, describes it as a true small-pox in its worst form. Connected with this detail we find the following interesting case:—Mr. T., about eighteen years of age, was first vaccinated in India in his infancy; he was re-vaccinated in Scotland, whence he had returned about eight months. Two days after his arrival in Silhet he was attacked with severe rigors, nausea, vomiting, and slight delirium. These symptoms were followed by a copious eruption, which spread over the whole body, and was evidently of a variolous character. The origin of this disease attracted the attention of Mr. Brown, and he observes, "we can only ascribe it to one or other of the two following sources of infection:—the eruptive disease which attacked the Europeon children above referred to, or that which prevailed epizootically among the cattle."*

In the present argument it is of little moment to which of these sources we ascribe the disease. The

* See the *Calcutta Quarterly Medical Journal.*

case is brought forward merely to show the feeling in the mind of the writer, that it might have arisen from the pestilence which was then raging among the cattle.

These facts have all but proved that the vaccine disease is not a preventive of small-pox, but the small-pox itself. In order to complete the demonstration, it is necessary to show that the *human small-pox* can be communicated to the cow in like manner as the disease of the latter has been communicated to man. There are good grounds for believing that many of the variolous pestilences that have at different times laid waste the various regions of the earth have been common both to man and the brutes. It would be improper in a report of this kind to enter into historical details illustrative of this point; but they are to be found in abundance in the writings both of the physicians and the chroniclers of the earlier and middle ages. We shall, therefore, at once proceed to mention other events that tend to confirm the opinion respecting the identity of the *human small-pox* and the *cow small-pox.* The first we shall notice occurred many years ago in America, and is recorded by Dr. Waterhouse, of Cambridge, Massachusetts, in a letter to Dr. Jenner. His words are, " At one of our periodical inoculations, which occur in New England once in eight or nine years, several people drove their cows to an hospital near a populous village, in order that their families might have the daily benefit of their milk. These cows were milked by persons in all stages of small-pox ; the consequence was, the cows had an eruptive disorder on their teats and udders, so like the small-

pox pustule, that every one in the hospital, as well as the physician who told me, declared the cows had the small-pox."

No inoculations were performed with the virus from these cows, but it is impossible, we conceive, to doubt the fact that on this occasion the small-pox had been conveyed from man to the cow, just as it had been communicated, in the dairies of Gloucestershire, from the cow to man.

Many unsuccessful efforts were made by different individuals in England to put the question beyond all dispute, by directly inoculating the cow with human small-pox. This experiment is said to have succeeded at the Veterinary College, in Berlin, so early as 1801 ; and M. Viborg declares that he communicated the disease likewise to dogs, apes, and swine. It is mentioned in the *Saltzburgh Medico Chirurgical Journal*, for 1807, that Gassner was equally successful in imparting the small-pox to the cow by inoculation. Similar information is detailed in a paper read before the College of Physicians, by Dr. Mc Michael, in 1828. "Vaccine matter having failed in Egypt, medical gentlemen were led to institute certain experiments, by which it has been discovered that by inoculating a cow with small-pox from the human body, fine active vaccine virus is produced." It is added that several children had been vaccinated with this virus with complete success. Professor Sonderland, of Bremen, took another method to inoculate the cows. He covered them with sheets on which persons labouring under small-pox had lain, and in this manner, it is said, conveyed the infection.

It has been customary to treat all these examples as unworthy of consideration. This scepticism might have been justifiable at one period, but to persist in it after the direct corroboration about to be offered, would be to act in the spirit of Pyrrhonism, rather than in that of philosophic caution and candour.

What many gentlemen in this country failed to accomplish, we are happy to say has been at length achieved by one of the members of our Association, Mr. Ceeley, of Aylesbury. Influenced by some of the facts and reasonings mentioned above, he resolved to attempt to ascertain whether he could, by inoculation, impregnate the cow with human small-pox. Twice he has succeeded in accomplishing this important object after many previous fruitless trials. His experiments were conducted in the presence of five medical men and one veterinary surgeon. He produced five vesicles on the cows, from which source several hundred patients have been vaccinated, who have exhibited all the phenomena of vaccination in the most perfect form and complete degree; there was no attendant eruption, nor any thing that could lead him to suspect that he had not in this manner propagated the genuine *Variolæ Vaccinæ*. He kindly transmitted portions of this lymph to the President of the Section, who immediately committed it to the care of Mr. Coles and several other gentlemen, in whose hands it produced the most regular vesicles, which in every respect corresponded with those so beautifully delineated by Dr. Jenner, in his first publication. This circumstance forcibly arrested the attention of every one

who saw the vesicles, and that too, in several instances, though the source whence the lymph was derived was not known. The correctness of the vesicle formed by it, exhibits a marked contrast to that which we have seen produced by other virus now in use; and we fear that the local as well as general disturbance occasioned by the latter, so far from being a source of protection, will be found to be the reverse.

Though the detail of Mr. Ceeley's very interesting experiments will be found in his own communication, we deem the question so momentous that we are induced to offer a short abstract of some of them, which he has kindly enabled us to do.

On the first of February, 1839, he inoculated with small-pox matter (*variola discreta*), of the seventh or eighth day, three young heifers; a fourth was at the same time vaccinated. We shall not mention all the particulars connected with these examples, but select the first as an illustration of the admirable skill and judgment with which the process was conducted.

Mr. Ceeley made seven punctures and introduced fourteen points near the left *labium pudendi,* and on the same day inserted two setons with matter from the same subject. On the ninth day after this process, he vaccinated the same animal on the right *labium pudendi,* with fifth, sixth, and seventh day's lymph from a child, in seven punctures with fourteen points; and below the pudendum in four punctures with eight points. On the tenth day after the insertion of the variolous matter, one of the punctures near the posterior margin of the left *labium pudendi*

had assumed the form of the natural vaccine vesicle. By gently removing the central irregular crust, and carefully puncturing the cuticle, he was able, in the course of an hour, to charge thirty-eight points with lymph, and on the same and subsequent days to use part of it on children and adults. On the thirteenth day the small-pox vesicle was more inflamed and florid; this was the fifth day after the insertion of vaccine lymph, at which time all the eleven punctures were converted into effectual vesicles; from these he took fine clear lymph, and used it on children and adults. Both the variolous and vaccine vesicles subsequently ran nearly a parallel course; so that on the twenty-sixth day of the former, and the seventeenth day of the latter, the the scars of both appeared perfectly similar.

To obviate objections which might arise from the insertion of the vaccine lymph on the ninth day after the inoculation with the variolous matter, Mr. Ceeley re-inoculated a sturk on the 15th of February with small-pox matter, of the seventh or eighth day, on the *labium pudendi*. He made eight punctures, which were deluged with the variolous fluid from capillary tubes. On the fifth day the four upper punctures were enlarged and elevated; the other four were less so. On the sixth day all presented the appearance of the vaccine vesicle. From one of them he took lymph with difficulty, and scantily charged thirty-nine points. On the eighth day he again took lymph from the vesicle opened on the sixth. On the ninth day the vesicles were enlarging, and he again opened carefully the first vesicle and charged twenty points. On the tenth day the four

lower vesicles were increasing, and from them he charged twenty-seven points. After this time the brown crusts appeared, and the disease gradually declined. This animal was subsequently inoculated both with variolous and vaccine matter, but no result followed.

The practice of inoculating the cow with vaccine virus taken from man was very early attempted. It is not to be overlooked that the difficulty of accomplishing this, is almost as great as that of inoculating the animal with small-pox. It succeeded however in the hands of Dr. Waterhouse, who, in 1801, impregnated one of his cows, and obtained from her a "crop of matter on the ninth day, which produced the disease in the human subject to perfection." Mr. Fox, of Cerne Abbas, who has paid great attention to this subject, and seen the disease, as well among the cattle as on the hands of the milkers, has also successfully vaccinated the cow.

The same experiments have been performed at Passy, in the neighbourhood of Paris; the lymph found there in 1836, among the cows, has been recently again passed through the animal, and this is called retro-inoculation. Mr. Ceeley, too, has often been enabled to communicate the vaccine disease from man to the cow. He has observed that good human lymph, when transmitted in this manner, loses some portion of its activity; it rises late, and produces smaller vesicles, but ultimately, *after successive inoculations on man,* it resumes its activity.

We cannot refer to this triumphant and most important conclusion of an investigation of more than fifty years duration, without congratulating the Association that it has been accomplished in the country of Jenner, and in a manner to substantiate all his conclusions. Well may we now say, to use his own language, that "Vaccination is placed upon a rock," and that "if properly conducted, it will secure the constitution as much as variolous inoculation possibly can." In these statements he anticipated the demonstration which we have the happiness now to bring forward; and we dare not, without the greatest injustice, pass by this interesting and impressive incident in the history of vaccination, affording, as it does, another brilliant testimony to the skill and genius of a man who has not yet been honoured as he deserved.

The highly valuable information which we have just brought forward, cannot fail to have a most salutary influence. The right understanding of this question, both by the profession and by the public at large, we feel assured will greatly tend to remove the prejudices which still exist, to secure correct and satisfactory practice, and enable us to speak with confidence respecting its nature and object, as well as of the protection that it affords. The attempts that have been made to enforce the views contained in the preceding observations, have hitherto been less successful than might have been anticipated. Now we look forward to better results, hoping that the Report emanating from this Association, will effect what individual exertions could not accomplish.

Out of the materials collected in the preceding pages, and from other sources, we deduce the following aphorisms:—

First then, it has been proved that cattle, in many ages and different countries, have been afflicted with small-pox.

Secondly, that this disease among the inferior animals, has simultaneously existed with the small-pox in man, and pursued its victims through every quarter of the globe; and that it exists at this time in Asia in a fatal and pestilential form.

Thirdly, that it appeared among the cattle in England in the year 1745, and again in 1770, and continued its ravages up to the year 1780; and that the local remains of this epizootic occasionally still show themselves with considerable severity.

Fourthly, that the casual transmission of this disease to the milkers in the dairies of Gloucestershire, and their subsequent immunity from human small-pox, first led Dr. Jenner to the investigation of this singular affection, and ultimately to establish it as a substitute for the more pestilential and fatal form of the disease.

Fifthly, that when the disease appears among the inferior animals in a malignant form, it produces, by inoculation, a disease of similar severity in man.

Sixthly, that as man has received this affection from the cow, so likewise has the cow received it from man.

Seventhly, that the direct inoculation of the cow with human small-pox, has produced a mild and mitigated disease; and that such disease, reproduced by inoculation on man, accords entirely in

its character, in its progress, and in its protecting influence, with the *variolæ vaccinæ*, as described by Dr. Jenner, thus irresistibly proving his fundamental proposition, that cow-pox and small-pox are not *bonâ fidê* dissimilar, but identical, and that the vaccine disease is not the preventive of small-pox, but the small-pox itself,—the virulent and contagious disease being a malignant variety.

CORRECT VACCINATION AND IMPEDIMENTS THERETO.

In order that the subsequent observations may have a clear and definite meaning, we think it necessary to lay down plainly what we conceive to be required to render the process of vaccination as perfect as possible. We have been constrained to adopt this course from observing the great discrepancy that exists between the statements of different individuals with respect to its protecting power, which we are convinced could not have happened to such an extent, had uniformity of practice been followed.

From the commencement of this practice, efforts were made to ascertain when it had fully taken hold of the constitution, so as to afford reasonable hope of future security. The comparative mildness of the affection rendered this an important point of consideration, and up to this hour it has lost none of its interest. The only perfect test is that which arises from the insertion of the variolous lymph, but as that is on many accounts objectionable, it is better to find out, if possible, some other.

The first to which we would advert, is the regular progress of the vaccine vesicle, and we would lay it down as an axiom never to be forgotten, that no one is qualified to speak of its effective character who has not, at suitable periods, noted this progress. The genuine disease can only be produced by pure lymph from a regular source. The time for taking this lymph, according to Doctor Jenner, is between the fifth and eight days, and before the formation of the areola. Others have recommended the use of lymph taken at a much later period; but this we believe to be a very questionable practice, and ought never to be followed. It is very true that the affection may be propagated by virus found in the scab, but this only succeeds when active lymph is preserved in a dried state within the scales.

A test, dependant upon the successful progress of vaccination, was very early noticed by Dr. Jenner, and subsequently brought forward by Mr. Bryce, of Edinburgh. He proposed that some fresh vaccine lymph should be inserted into the patient a few days after the first vaccination. This practice was founded on the observation that the second vaccination proceeds with accelerated speed, provided the first has taken effect. It is a very simple and beautiful illustration of the constitutional effects of vaccination, and deserves to be encouraged. An experienced eye will for the most part be able to detect any deviation from the true vesicle. Unfortunately, the means of making correct observations are often denied to medical men, and any thing that would secure greater attention to this branch of the subject would be of high value, and unquestionably

would have prevented many of the failures that have recently taken place.

The second point demanding unvarying assiduity, is the character of the lymph employed. It never ought to be taken from a vesicle which deviates in the least degree from the perfect standard, nor from a patient labouring under any cutaneous disease. It is to be feared that these rules have not been punctually observed; and that deviations have been propagated, which afford varying degrees of security, according as they approach to or recede from the healthy character.

A third point which ought ever to be insisted upon, is the leaving one or more vesicles to run their course without being in any way disturbed. This canon was introduced at a very early period, but we have more than cause to suspect that it has been often defeated, either by the carelessness of parents, or the hurried manner in which vaccination is sometimes performed.

Another point on which perhaps too much stress has been laid, is the appearance of the cicatrix. It is true that after regular vaccination, it generally assumes an uniformity of aspect well known to medical men. The medical officers of the army and navy are compelled to rely a good deal on its appearance; and all recruits on whom it is supposed not to be perfect, are subjected to vaccination. The experience obtained from these services, is, so far as it goes, in favour of information derivable from this criterion. We are satisfied, however, that by itself it ought never to be absolutely trusted, and we must repeat here, what we have already observed, that

nothing but a watchful inspection of the progress of the vesicle will justify any one in speaking with confidence of the security likely to be attained.

From all we can learn, we are inclined to believe that though the presence of a perfect cicatrix is not a sure sign of protection, its absence must be held to speak strongly against the existence of vaccine influence. The peculiar appearance of the cicatrix is caused by the reticulated or cellular structure of the vesicle. The same organization occurs also in variola. Now, if the vesicle has been repeatedly opened or broken, the ulcerative process that succeeds destroys the organization of the cells and leaves a cicatrix nearly smooth, instead of the well defined indented surface, which for the most part may be seen after complete vaccination. It may also be observed that many persons who have been extensively marked and seamed by small-pox have had subsequent attacks of that disease, proving that after perfect human small-pox, as well as after perfect cow small-pox, a second attack may occur.

Mr. Dodd, of all our correspondents, seems to have paid most attention to this part of the subject. Of fifty-seven cases that had been exposed to the contagion of small-pox and escaped, in six only was the cicatrix perfect; in fourteen it was slightly defective; in thirty it was very imperfect; and in seven it was totally wanting. Out of seventy-seven cases of small-pox after vaccination, one bore a perfect mark, fourteen had the cicatrix slightly defective, forty-seven were imperfect, and fifteen had none at all. Thus, to sum up the whole, out of one hundred and thirty-four cases of vaccinated persons

who had been exposed to small-pox, the cicatrices of seven were perfect, and one of these failed; twenty-eight slightly defective, of which fourteen failed; seventy-seven very imperfect, forty-seven of which failed; twenty-two had no marks at all, and of these fifteen had small-pox, while seven altogether escaped.

Our correspondents amply justify us in laying down the foregoing principles; and we also think from the evidence before us, that vaccine lymph, though passed through a great number of subjects, and used for a great number of years, does not necessarily become deteriorated. This, however, can only be said when unceasing attention is paid to every successive transmission; for if a deviation commences, it may be perpetuated, and afford a gradually decreasing protection. There is no doubt that lymph of this kind has been often used. We have satisfactory illustrations of this truth from several of our returns. We will mention one out of many of this kind. Mr. Fox, of Cerne Abbas, thinks that more cases of small-pox have occurred after vaccination performed ten or twelve years, than after vaccination performed thirty years ago, and that this arises from the extensive propagation of imperfect cow-pox, which only affords a diminished amount of security. A remarkable instance came under his observation a short time ago. A father and two children were inoculated with fresh small-pox virus from the same child, and at the same time; both children caught the disease, and the father escaped, though he had been vaccinated more than thirty years. It will be observed in sub-

sequent parts of our Report, that failures are noticed at all periods, from a few weeks after vaccination up to thirty or more years. It has been supposed that they are most common at and after the age of puberty; but this is certainly not the opinion of our correspondents in general. Some, it must be admitted, do affirm that small-pox has more frequently occurred in persons recently vaccinated, than in those at a remote period, while others assert that time makes no difference.

The influence of cutaneous diseases on the progress of the vaccine vesicles is a point, too, demanding greater attention than it has hitherto obtained. At a very early period Dr. Jenner discovered that the affection was very much modified in its progress by the scaly tetter, and those affections described by Dr. Willan under the term *psoriasis,* as well as those vesicular eruptions commonly called herpetic. He observed that vaccination performed on a skin occupied by any of these diseases, "produces every gradation from that slight deviation from perfection, which is quite immaterial, up to that point which affords no security at all." We have seen the herpetic affection occupying the angles of the mouth, the upper portion of the lip near the nostrils, or the tender skin behind the ears, cause the vaccine vesicle to assume an incorrect form, containing an opaque fluid, with an irregular efflorescence of a dusky red colour. We have also seen similar irregularities commencing from a like cause, which completely disappeared on destroying the herpetic affection, by applying a little of the liquor plumbi. The case to which we at present

refer, was under the immediate direction of Dr. Jenner himself. The premature and jagged efflorescence round the vaccine vesicle had appeared. He immediately detected the cause; and by the application above alluded to, destroyed the disease of the skin. In a very short time the deviation disappeared, and the vaccine affection subsequently ran its course in a regular manner. It does not uniformly happen that vaccination is thus impeded by the pre-existing cutaneous maladies; but wherever the disturbance is in the slightest degree manifested, the vaccination ought to be distrusted, and repeated as soon as the skin has been brought into a healthy state.

It is a very long time since these truths were impressed upon the public mind; but we have had many proofs that they are not yet sufficiently considered; it is, therefore, our duty to recal them. Dr. Jenner's last publication particularly refers to this point of practice; and we know that it caused him much disquiet that his admonitions and instructions were so little heeded.

Among those of our correspondents who have had most experience, and whose success has been most uniform, we find unequivocal testimony to the accuracy of Jenner's doctrine on this head. Many have made no observation at all respecting it; while some mention dentition, general ill state of health, scrofula, &c., as impediments to vaccination.

Other constitutional peculiarities stand in the way both of human small-pox and cow small-pox. Some resist these affections at one period of their lives and not at another; and there are examples of the very

opposite condition, which show that the individual will receive either infection as often as it is presented to him. These pecularities frequently run in families. We know several children of the same parent, who have had modified small-pox after cow-pox; and not many months ago three brothers had small-pox after small-pox, one of these cases proving fatal. On this subject we have illustrations from Mr. Dodd, who tells us that six brothers and sisters in one family having been vaccinated when children, had the small-pox a few years afterwards. In another instance, two sisters vaccinated in infancy, were subsequently inoculated and had small-pox slightly, they both caught the small-pox again in 1837, and one of them had it very severely. Their father caught small-pox; their mother too, who was inoculated when young, had it again in the same year; their maternal grandfather, beholding from a window at night, the funeral of a friend who had died of small-pox, sickened of that disease and died. These are a few of the affinities and concordances between human small-pox and cow small-pox; and we doubt not that every subsequent observation will establish the analogies. In confirmation we farther remark, that the great object of inoculation with human small-pox, was to produce an affection as much like that of cow small-pox as possible, and by great care in selecting the virus to be employed this was sometimes accomplished in a very remarkable degree. On the other hand, it is known that the disease, when casually caught from the horse or cow, is often a severe one,—as severe, it was said by an experienced observer, as for the

most part was inoculated small-pox. We ourselves have seen it, when caught from the horse, exhibiting great intensity, the hands and arms being covered with the eruption.

We will conclude this subject by an extract from one of Dr. Jenner's unpublished letters. "The greatest of all impediments to correct vaccination is that which arises from an herpetic state of the skin, indeed, compared with this, all the rest are as dust in the balance; and when the rules which I have again and again laid down respecting this point, and for so long a period are attended to, then, and not till then, will the confidence of the public be fully established as to its preventive power."

PROTECTING POWER OF VACCINATION.

The information communicated in the preceding sections bears directly upon that part of the enquiry upon which we are now about to enter. As long as doubts existed respecting the character of the disease derived from the cow, as long as it was a question whether it was of a variolous nature, it was impossible to predicate with any certainty whether it was likely to afford a permanent or a transient protection. Now, however, that we are enabled to say that it is a true small-pox, modified by passing through the constitution of the cow, we may proceed to the examination of this division of the subject with a greater degree of confidence than could have been assumed at any former period.

The limited duration of the security afforded by vaccination was one of the earliest objections

advanced against the practice. It was in fact a theoretical argument urged with much vehemence by persons who knew little either of the nature of human small-pox or of cow small-pox. It had no solid foundation to rest upon, inasmuch as all the knowledge acquired from casual inoculation among the milkers was against the supposition.

Dr. Jenner's confidence rested partly on evidence derived from sources of this kind; but it would have been insufficient, had not his investigations led him to the conclusion that he was recommending a mild variolous disease, instead of a malignant one; and to this truth, demonstrated as it now is, all our researches necessarily point.

Be it remembered, at the same time, as has just been observed, that the security derived from human small-pox, by no means depends upon the number of pustules and the severity of the disease. On the contrary, the diminution of the number was the object of every expedient successfully employed for the mitigation of this dreadful scourge, and experienced inoculators were well aware that a few, or even one, was capable of securing the patient from subsequent attacks. In this respect, the inoculated small-pox occasionally approximated to the character of cow-pox; so much so, that one of the most eminent physicians in Germany exclaimed on seeing the latter—"This pock will surely secure against the small-pox, being nothing else but a real and true genuine small-pock of the mildest sort; and you all know that ten thousand pocks give no more security than a single pock."

We are now about to test the validity of this

opinion; and, first, we shall bring forward some of the adverse testimony. One gentleman tells us, that of nearly one hundred cases of small-pox attended by him last year, one half were after vaccination. Another reports, that of eighty cases of small-pox, sixty or sixty-one had been vaccinated. Our correspondent mentions at the same time, that the majority of these vaccinations had been performed by a superannuated excise officer. The only fatal case that occurred had been vaccinated by this man, and by him pronounced to be safe. In the former of these two unfavourable statements, it is not specified by whom the vaccination had been conducted; but we would hope that they had not been under the direction of a medical gentleman. With the exception of the Report from the Small-pox Hospital about to be noticed, we have not received communications from any other quarter so discouraging as those just mentioned. Some gentlemen state that one in twenty of the cases of small-pox had occurred after vaccination, others one in ten, and others without giving any specific proof estimate them at one in three. There are those who merely mention that they have seen many cases; and a considerable number affirm that they have not seen one case.

It was formerly believed that if vaccination did not uniformly protect from subsequent attacks of small-pox, it at least modified such attacks, and for the most part prevented death. Things now are considerably changed; and we have it asserted, that the modifying and mitigating influence is often not discernible, and that a mortality of a very

alarming description has occurred in those that have been previously vaccinated. We have a statistical table drawn up by Dr. Gregory, of the Small-pox Hospital, in London, stating that in that hospital one hundred and three patients have died of small-pox after vaccination, between the years 1820 and 1839 inclusive. We enter upon the consideration of this statement with great sorrow and reluctance. Coming from so high an authority, it is calculated much to deaden our fond anticipations of the benefits derivable from vaccination, while at the same time it calls upon us to endeavour to find out any facts that may tend to allay our apprehensions. The total number of deaths, reported by all the gentlemen who have answered our questions, throughout nearly the whole of England, amount to very little above thirty. Again, we have the authority of gentlemen who have been engaged in the practice of vaccination from its commencement down to the present time, who have never met with an instance of this kind. The excellent Mr. Dunning, of Devonport, the friend of Jenner, and one of the most scientific investigators of vaccination, thus wrote to a member of the section a few months ago :—" Dining at the last quarterly meeting of a medical society established in these towns (*i. e.*, Plymouth and Devonport) nearly half a century ago, and of which I am now the only original member remaining (present fifteen members), and hearing them eagerly enquiring for some of *the pearl upon the rose,** I said, Gentlemen, I have to

* Dr. Jenner's figurative description of the vaccine vesicle.—See his Life, vol. ii., p. 305.

ask you all one straightforward question—How many fatal cases of small-pox after vaccination have you met with in your respective practices? Unhesitatingly and loudly all replied "Not one." We have expressly similar evidence from many towns in Gloucestershire—towns too where small-pox has often appeared, but has never proved fatal to one vaccinated person. More than two-thirds of the gentlemen who have favoured us with their experience, have not met with any case of this kind; one mentions seven, five of which were presumed to be *after perfect, two after imperfect vaccination;* six mention two; sixteen mention one, and one of these was uncertain.

The period to which some of these answers apply, extends nearly to the commencement of the practice. Mr. Warner, senior, of Cirencester, who began in 1802, and has vaccinated from six to seven thousand, has not met with more than ten or twelve failures, and not one death. Another gentleman, the late Mr. Wood, of Cheltenham, who commenced in the year 1805, under the immediate inspection of Dr. Jenner himself, and who continued to practise very extensively up to the last year, though he met with a few modified cases of small-pox after vaccination, never saw a death. We have testimony to the same effect from Dr. Henry Jenner, who was associated with his distinguished uncle in all his enquiries; he says he has never seen a death from small-pox after vaccination. From Mr. Ricketts, of Droitwich, we learn that he has extensively and gratuitously vaccinated for the last twenty-four years without ever having seen a case of regular small-pox subsequent

to vaccination in his own practice, and certainly not twenty cases of modified small-pox, and no death.

Mr. Ceeley, to whom we are so much indebted for valuable information on the subject of the *variolæ vaccinæ*, tells us that cases of small-pox after vaccination were rather more frequent in those long since, than in those recently vaccinated; but that cases occurred from one and a half to thirty years after vaccination. He adds that the modification in those which had been vaccinated twenty-two, thirty, and thirty-two years, was quite as great, or even greater, than in those who had been vaccinated only one and a half, or two and a half years.

Within the last three years, he mentions small-pox as unusually prevalent. There were twenty-eight deaths last year in Aylesbury, but not one of these occurred after vaccination. Mr. Ceeley observes, that the influence of vaccination in wholly preventing small-pox in a great majority of cases, and, where it failed to protect, in rendering the disease infinitely milder, was so palpable, as to compel the most prejudiced, and the lower classes in general, to recognise its value, and readily to seek its influence.

Another experienced observer, Mr. Goolden, of Maidenhead, who has been thirty-two years in this practice, states that though small-pox had prevailed last winter to a great extent, and was very fatal, he had not seen, in proportion, more cases of that disease after vaccination, than of small-pox after small-pox. He likewise affirms that the cases of failure are not more frequent than formerly; on the

contrary, considering the almost universal practice of vaccination, the proportion is diminished. Of such failures he remarks that he has reason to believe that many of them arose from neglecting to note the progress of vaccination, and making use of lymph from an imperfect vesicle, which only affords a partial security. Notwithstanding such negligent proceedings, he had not heard of one fatal result.

Of equal value is the testimony of Mr. Greenhow, of Newcastle-upon-Tyne, who thus sums up his experience :—" Leaving these details, I may observe that the most convincing proof of the immense importance of vaccination is to be found in the general result. If we look around us, we are seldom impressed with dismay at the disfigurement of the faces of our neighbours, or the destruction of sight which formerly resulted from the constant prevalence and severity of small-pox, and if a death or two occur in the neighbourhood, the public feeling, which they never fail to excite, is sufficient proof of their diminished frequency.

" On the whole, my own conviction amounts to this, that vaccination is at least equal in its protecting power to small-pox itself, for I see more severe cases of secondary small-pox, than of that disease after vaccination ; and that, notwithstanding its occasional failure, it has been the means of saving an incalculable number of lives, millions of pretty faces, and thousands of persons from loss of sight."

According to Mr. Batt, of Brecon, who began to vaccinate in 1798, very few cases of small-pox have followed vaccination in his experience. In most instances of that description which he has heard of,

the vaccination has either been interrupted in its progress, or performed by a non-medical person. He gives a melancholy example of the effects of such mal-practice; a large family had been "cut" by an itinerant quack, most of whom subsequently caught the small-pox and died. On enquiry, he found that not a trace of vaccine vesicle had been excited. The only case of failure that had taken place in his own practice, was after a lapse of twelve years, and he ascribes it to the breaking up of the vesicles to supply lymph for vaccinating other persons; the case was confluent, and nearly proved fatal. The brothers and sisters of the patient, who were constantly with him in the same room, escaped. He has never seen a fatal case of small-pox after vaccination, but he has seen five cases of small-pox after small-pox.

Mr. Bloxham, of Newport, Isle of Wight, states that he and his father could, altogether, enumerate about twenty-four persons in whom small-pox had followed vaccination; of such cases they themselves had only seen nine, two of which occurred between June 6, 1837, and June 6, 1838. This, we believe, includes their experience during the whole of their professional lives. It is farther added that there had not been any death from small-pox during the last year, though the disease had been introduced into the poor-house, but by great exertion it was prevented from spreading, seven out of seventy-four children only having taken it. This testimony is corroborated by that of Mr. Phené, of Ryde, who had, during the last year, seen no case of small-pox at all. Mr. Bloxham likewise says that he does not find

cases of small-pox after vaccination more frequent now than they were fifteen years ago.

Mr. Trash, of Upton-upon-Severn, whose experience has been almost coeval with the promulgation of this practice, states that he has seen no cause to doubt the efficacy of vaccination. Since he left the army, and settled thirty-one years ago, he has had two cases of small-pox after vaccination, both very mild and modified; he has had three cases of secondary small-pox, two after inoculation, one of which proved fatal.

Dr. Hennen, Physician to the Royal Military Asylum for the reception of the orphans of British soldiers, states that all the children admitted into that institution are vaccinated, whether they have been previously vaccinated or not. From the year 1819 to 1837, one thousand four hundred and six children have been admitted; of these one case of small-pox or varioloid eruption happened in 1826. Eight other cases, which in his returns are classed as chicken-pox, appeared during the whole of the above mentioned period. This is the more satisfactory, because he mentions that small-pox had been very prevalent and fatal among the poor within the last few years.

Our Secretary, Mr. Dodd, mentions two hundred and one cases of small-pox as occurring in the year 1837. Of these, one hundred and fourteen were after reputed vaccination. Ninety-one cases were mild, twenty-three were severe, and two were fatal. Of the eighty-seven unvaccinated persons, twenty-nine cases were mild, fifty-eight were severe, and seventeen fatal.

He also gives an account of one hundred and one cases which had been vaccinated and subsequently had small-pox, with a view to illustrate the periods that elapsed between vaccination and seizure by small-pox, from which it is shown that the greatest number occurred after a period of one year, namely, nineteen ; whereas, on the other hand, the number of failures seems to diminish with time. In connexion with this subject is another statement of sixty-five cases that had been vaccinated, and subsequently exposed to small-pox, both by inoculation and effluvia. The period of exposure varied from one year to thirty-four, and the disease was resisted by the whole.

Though Mr. Dodd mentions so many cases of small-pox after vaccination, it is proper to add that he has *not seen a single instance of small-pox in a patient whom he had vaccinated, though he had resided at Chichester ten years.*

We will next advert to the reports from the vaccinators of the National Establishment, including their experience from the year 1825 to the year 1832. In that period eighty-three thousand six hundred and forty-six patients were vaccinated at the different stations. Among the whole of that number, only two cases of death from small-pox after vaccination are mentioned, and one of these was of a very doubtful nature. The patient, Sophia Wallis, was vaccinated May 10th, 1829, but was not in attendance afterwards for inspection ; the mother reported that one spot arose in one arm, and attained its utmost height on the third day, and this circumstance is sufficient to prove that the process must have been

incomplete. The other cases of small-pox after vaccination mentioned in the report are very few, and the majority occurred in persons who had been exposed to variolous influence previous to infection.*

Another very interesting document is found in the same report. It contains a return of the children admitted into the Royal Military Asylum at Chelsea, from the commencement of the institution in August, 1803, to August, 1833, and specifies the number who had undergone vaccination, small-pox, varicella, &c. Those reputed to have had small-pox previous to admission were two thousand five hundred and thirty-two; one thousand eight hundred and eighty-seven being boys, six hundred and forty-five being girls. The number reputed to have been vaccinated before admission was three thousand and sixty; viz., two thousand four hundred and ninety-eight boys, and five hundred and sixty-two girls. Those who had small-pox after reputed small-pox were twenty-six; fifteen boys, and eleven girls. The cases of small-pox after reputed vaccination were twenty-four; nineteen boys, and five girls. The total vaccinated at the Asylum subsequent to admission was six hundred and twenty-eight; viz., four hundred and sixty boys, and one hundred and sixty-eight girls. Of the whole, only two boys and one girl caught the small-pox. Five deaths occurred; four boys and one girl. Of these five children, three had the disease after reputed small-pox, and two had neither been vaccinated nor had undergone small-pox before. We regard

* See Appendix to Report from Select Committee on the Vaccine Board, page 140.

this document as one of the most important that has appeared in this country. It very fairly tests the qualities both of small-pox and cow-pox. All the patients were placed under exactly similar circumstances; and what is the result? A greater number of cases of small-pox followed small-pox than vaccination; and of the five fatal cases, three were after small-pox, whereas not one occurred after vaccination. This convincingly shows what may be done by cautious and prudent management; and on that account eminently deserves the serious attention both of the profession and the public.

These statements are in accordance with the experience of the majority of our correspondents. We will now avail ourselves of some occurrences that have recently taken place in Dublin.

At a meeting of the College of Physicians held on the 18th of January, 1839, Dr. Montgomery advanced the opinion that vaccination affords only a temporary security, and that its protective influence is now less than it was when the practice commenced. This called forth important counter-statements from several of the physicians and surgeons of that city. Dr. Maunsell asserts that the real origin of the failures is to be found in the neglect of the careful performance of vaccination, and to the practice of small-pox inoculation, which is indirectly encouraged by the alarmists. Dr. Labatt, who, from the commencement, has bestowed the most unwearied attention to the character of vaccination, and watched its practice with equal care, thus delivers his sentiments:—"It is very true that many instances have from time to time been brought before

the public, of persons attacked with small-pox, who were believed to have regularly had the cow-pox; but from my experience of the manner in which the latter has been conducted, I assert, without fear of contradiction, that these reputed failures have almost invariably originated either from want of skill, or inattention of practitioners, from inoculation having been performed by unprofessional persons, or the extreme inattention of parents and others in not showing children at the several stages of the affection. I do not pretend to say that cow-pox any more than small-pox inoculation is infallible, but having been thirty-six years and upwards extensively engaged in the practice, without witnessing a single case of death from small-pox after regular vaccination during that period, nor more certainly than ten, if so many, in which small-pox (in four of whom the disease was severe, and in the remainder very mild,) occurred in persons who previously had cow-pox, I feel justified in stating that cow-pox, if skilfully applied, and conducted with that attention which it requires, will almost invariably afford a permanent security against small-pox." He farther adds, my experience leads me to say, with the immortal Jenner, that perfect vaccination is permanent in its influence.

Dr. O'Brien, senior physician to the Fever Hospital, which is the chief receptacle for small-pox among the poor of Dublin asserts that no case had occurred in that institution during the last twelve months, and that for a period of twenty-five years a few incidental cases only of small-pox had been admitted into the hospital, and those were generally persons who had not been vaccinated. He does not

recollect the disease being communicated to any of the surrounding attendants or patients, though it was sometimes of a malignant and confluent character. This he attributes to the immunity afforded by vaccination. It is his opinion that the cause why small-pox has increased in Great Britain to an alarming extent, while it is nearly extinct in Ireland, is to be found in the neglect or careless employment of vaccination in one country, and to its universal adoption, and more attentive, not to say scientific, performance in the other. We may observe in passing, that the report from Glasgow noticed in another page, strikingly corroborates this opinion of Dr. O'Brien.

One other testimony from the Dublin Foundling Hospital may be added. The late Professor Creighton introduced vaccination into that institution in the year 1800. Many of the children were at two different periods inoculated with small-pox virus under his inspection, and completely resisted it. His son, who has now been surgeon to the same institution for more than twelve years, mentions that "nothing has occurred in its medical annals to take from or condradict the experiments mentioned above. Many of the subjects of them are still living, and amongst them my brother, who was tested with the small-pox infection at two distinct periods; the first at seven years, and the second at ten. He resisted the disease. He is now upwards of thirty, and has often been exposed to small-pox without any effect." This communication is dated Foundling Hospital, February 15th, 1839.

The last report of the Dublin Cow Pock Institu-

tion, which has been kindly sent to us by Dr. Labatt, contains some facts which speak powerfully in favour of the permanent security afforded by perfect vaccination. In the year 1827, the small-pox appeared in one of the largest institutions in Dublin, the average number of inmates being between 2000 and 3000. The disease attacked one hundred and six individuals, and was confined chiefly to the nursery, in which were one hundred and forty one children, together with their mothers or nurses, many of the latter having been vaccinated during their infancy or childhood, and they all escaped the small-pox, though placed under circumstances most favourable for the reception of the infection. Up to the 28th of March of the present year, thirty-eight cases of small-pox have occurred, and notwithstanding the close and constant intercourse which arises from the crowded state of the establishment, no instance of small-pox after vaccination was observed, excepting in one child, who was said to have been vaccinated two years ago in Liverpool, but on whose arm there was no trace of cow-pox.

Mr. Kirby, of Dublin, likewise, who for a period of more than thirty years has had most extensive opportunities of observation, both in public and in private practice, states in the most unqualified and emphatic manner, his firm belief in the protective power of vaccination. He is thoroughly acquainted with Dublin and its prevailing diseases, and he justly observes that he must have seen variola among adults of all ages, had the prophylactic virtues of vaccination been temporary and evanescent as some have asserted them to be.

We cannot pass by this division of our enquiry without referring to the experiments and opinions of Dr. Sacco, of Milan, unquestionably the greatest vaccinator in the world. He, a few years ago, inoculated with small-pox a considerable number of individuals who had been vaccinated from six to twenty-four years, and he found that they all resisted the disease. To this may be added the testimony of Dr. De Carro, of Carlsbad, formerly of Vienna, one of the earliest and most distinguished promoters of this discovery on the Continent. In a letter lately transmitted to the President of this Section, he observes, "as far as I know, vaccination is perfectly well carried on in Germany. In Austria it could scarcely go on better." He has likewise afforded a very strong testimony to the permanency of the character and influence of the vaccine lymph. He had presented a memorial to the Government of Bohemia, proposing that all physicians and surgeons in that kingdom who should have occasion to observe either the *variolæ vaccinæ* or the *variolæ equinæ*, and obtain lymph from such sources, should be instructed to communicate their observations to the respective authorities, in order to increase our knowledge of a subject so important to mankind. Dr. De Carro was induced to take this step in consequence of the *variolæ equinæ* having been lately found in Bohemia by Dr. Kählert, of Prague, who had employed it successfully, both in inoculating cows and the human species. The Government referred the question to the faculty of medicine, who having carefully deliberated upon the subject, observed that they did not consider the renewal of

the vaccine lymph indispensably necessary, inasmuch as that then in use presented always the same succession of symptoms, and had lost none of its primitive efficacy, and as long as this continued, they believed that nothing could be added to its perfection as a preservative.* This last remark leads us to a point which at this moment is attracting no small degree of attention in this country. It has been assumed that the lymph now in use is less active, and that the vesicles which it engenders are less developed and perfect than they were in former years; and to this circumstance has been ascribed the increased number of cases of small-pox after vaccination which have been recently observed. We are quite prepared to admit that lymph of this deteriorated quality has been too often employed, but we do not think this circumstance at all justifies the conclusion that has been drawn from it. About the years 1817, 1818, and 1819, many complaints arose from different parts of Europe of the imperfect or inefficient character of the lymph then in use. A vast number of inoculations were performed with lymph of this character. How far it may have been diffused it is impossible to tell; but it is highly pertinent to observe that a great majority of the failures which are said to have occurred of late years, probably happened among persons who received this deteriorated lymph, it having been observed that individuals who had been vaccinated about the periods above mentioned, have been principal sufferers from small-pox. Within these few months we have seen vesicles produced by

* See *Almanach de Carlsbad*, 1834.

lymph very recently obtained from the cow, and vesicles produced by lymph transmitted from one subject to another for a long series of years, and no defect in the qualities of the latter could be detected, they being equally complete and well formed with the former. The same truth is substantiated by one or two of our correspondents, especially by Mr. Taylor, of Cricklade, who says, in reply to one of the questions, "I had an opportunity some years ago of using lymph obtained from the cow, and my impression at the time was, that the character of the vesicles was essentially the same with that obtained from the older lymph." The testimony of the National Vaccine Board is precisely in accordance with this experience, as may be seen by a reference to their last report.

While we feel ourselves called upon thus to express our belief in the permanent influence of duly conducted vaccination, we would at the same time recommend the employment of genuine vaccine or equine lymph whenever it can be obtained, cautioning gentlemen to acquire such a knowledge of the disease among the inferior animals as will prevent them from employing matter from other eruptive affections which afford no protection at all, and which caused much perplexity to Dr. Jenner in his early investigations. The means of producing the true disease are now, by the labours of Mr. Ceeley, placed within the reach of every one, and those incorrect pustules to which cows are liable, and which it is to be feared have too often afforded spurious matter for inoculation, will henceforth be avoided. It is needful to bear these things in

mind, as we perceive that the efficiency of the virus has recently been estimated by the degree of excitement, both local and general, produced in the constitution. We have lately seen several instances where the disturbance was very great, and we are anxious to recal to the minds of our professional brethren the important observation, that extensive and active local inflammation, so far from betokening perfect vaccination, is almost invariably symptomatic of the reverse. In proof of this, we would refer to the beautiful representations of the vaccine vesicle originally published by Dr. Jenner, and the cautions delivered by him on this very point. In connexion with this subject, we may mention another practice which has arisen, we believe, from incorrect views of the best means of producing vaccine influence. All who imagine that local or constitutional irritation measures the intensity of the effect, wish, of course, to increase that intensity by employing what they conceive the most active virus, and multiplying the number of vesicles. The insertion of the virus in three, or, at the most, four places, we believe to be quite sufficient. This will allow of one or two of the vesicles to be opened for the abstraction of lymph, and the others to proceed in their regular and undisturbed course. If this be done, and the lymph be pure, and the constitution unoccupied by any other disorder, the protection will be as great as if a much larger number of pustules had been excited. This truth is in some degree illustrated by the analogy of small-pox itself, as many of the secondary cases have occurred in individuals who previously had the disease in a severe form.

Another law with regard to the protecting power of vaccination has been recently laid down. Vaccination, it is said, may afford a degree of protection amounting almost to perfect security during the early period of life; but that it loses this protecting power at the age of puberty, and undergoes a gradually diminishing influence from this time to confirmed manhood. Some tables published in the last Report of the Small-Pox Hospital, seem to countenance this idea. It is assumed that this proposition could not have been known to Dr. Jenner and his immediate followers. We are not exactly aware of the grounds on which this opinion rests. Dr. Jenner lived twenty-seven years after the inoculation of his first patient, Phipps. More than two generations must have reached the age of puberty in that interval, and, if the truth be as it has been represented, it must have been as fully brought to light before his death, as at this period. But seeing it has only been started lately, and the instances by which it is supposed to be confirmed have occurred since his decease, we may infer that they may have arisen from a cause of a different kind. Eighteen or twenty years ago, as has already been said, complaints were very generally made of the imperfection of the vaccine virus. Inoculations performed at that time with such imperfect virus, may perhaps explain the reason why so many failures have taken place in persons of the ages referred to in the tables.

It is our duty also to specify that the information derived from the ablest medical gentlemen in Gloucestershire, and from enquiries instituted respecting the state of patients vaccinated, both by Dr. Jenner

and his immediate connexions, gives no support to the notion. Had it been well-founded, many epidemical attacks of small-pox which have prevailed in this district, must have confirmed it. In the town of Cheltenham there has been considerable prevalence of small-pox during the last few months. We have had several cases of small-pox after small-pox, one of which was fatal. There have been cases of modified small-pox after vaccination, but these failures have certainly not happened uniformly at the period at which we are taught to expect them.

From an impartial review of the whole of the evidence submitted to us, we are called upon to declare that, with one exception, we do not find any thing to authorise statements respecting periodical failure. That the protecting power of cow small-pox may disappear, must be conceded; but this is no more than occurs with those who have had human small-pox, for they are alike subject to a second attack of the same disease. After the demonstrations already given, we feel ourselves called upon to stand firmly upon this ground. Opinions, which formerly admitted only of analogical illustration, have now received direct and positive confirmation, and we, therefore, hold it to be proved beyond all doubt, that the same general laws which govern *human small-pox*, apply, "*mutatis mutandis*," to *cow small-pox*. We have a great weight of testimony, all entitling us to assert that the cow small-pox, duly and efficiently communicated to man, does not lose its influence by time. From personal observation, we are entitled to speak with considerable confidence on this point; and many of our

correspondents, who have been longest acquainted with the practice of vaccination, tell us that they have met with nothing leading them to believe that such a law exists with respect to the disease. Some have not specifically touched upon this part of the subject, but the proportion of those who speak decidedly respecting both the completeness and the permanency of the protection, may at least be quoted as ten to one. We have such expressions as the following:—"Vaccination properly performed, not transient, nor evanescent."—"When perfect, vaccination affords not a temporary but an unlimited protection."—"When it is genuine, its protection continues through life."—"Feels no fear if the virus be good, and if it go through all its stages."—"Protection complete through life if the perfect disease be given." It is unnecessary to produce more language of this kind.

Conflicting evidence we have. There is, however, no other way of proceeding on such occasions but by recurring to first principles. The questions therefore we are constrained to ask, when we hear of a great number of cases of small-pox after vaccination, are—

1.—Has the lymph been pure and perfect?

2.—Has the development of the affection been regular and complete?

3.—Has the state of the recipient, both with regard to the condition of the skin and other constitutional peculiarities, been such as to present no impediment to the regular course of the affection?

We find that all the gentlemen whose sentiments are most firm and uncompromising, and who appear

to have most carefully watched the character and progress of *cow small-pox,* have paid the most undeviating attention to these points. They never take lymph from an imperfect vesicle, nor at an improper time; they are not satisfied if the areola appears too early, or if it is irregular in its form; they never consider a patient safe unless one or more vesicles have been left untouched. Now all these are conditions, the value of which has been ascertained by the experience of forty years; and it admits of no dispute, that gentlemen who have sedulously kept them in view, have had reason to be gratified with their success. It is not for us to say whether, under circumstances of a more unfavourable nature, all these essentials have been attended to; but it becomes us to say, that *unless they have been invariably attended to, no one is entitled to assert that vaccination has been duly performed.* Could we apply this principle to some of the most discouraging returns presented to us, we are confident that they would wear a very different aspect from what they do at present. In one or two of these examples the vaccinations have been performed by persons not at all connected with the profession, and of the lowest and most illiterate classes.* We cannot, therefore, be surprised that disappointment should occur when so delicate a process is conducted by such unskilful hands.

All cases of reputed vaccination, unless they have passed under the review of a competent judge, who

* Itinerating quacks, petty tradesmen of an inferior order, blacksmiths, excisemen, nurses, druggists, &c.; the poor, one with another.

has witnessed the different stages of the affection, should be considered AS NO VACCINATIONS AT ALL.

Until this canon be universally admitted and acted upon, we shall never have attained the complete security that vaccination is capable of affording. Failures may still occur, but they will neither be so numerous nor so fatal as they have been reported. We have abundant evidence for these positions, derived from long experience; and have now the superadded confidence obtained from a real knowledge of the nature of the disease of which we are treating. *Cow small-pox and human small-pox, we repeat it, are alike in their general properties; and if the latter, once taken, for the most part prevents subsequent attacks, so, in like manner, does the former.*

SMALL-POX AFTER SMALL-POX.

Having already adverted to small-pox after vaccination, we have a few remarks to offer upon small-pox after small-pox. This occurrence is still questioned—a scepticism somewhat remarkable, considering the evidence by which the truth is supported. Many of the older writers believed the fact; neither was it overlooked, till it was found expedient to induce persons to submit to small-pox inoculation. It forms a very essential part of our duty to dwell upon this point, and to show that if there are different degrees of protection afforded by *human small-pox*, so, in like manner, must we look for gradations in the protecting power of the *cow small-pox*. This was an axiom maintained by

Dr. Jenner, when our knowledge was less complete than it now is; and it affords us peculiar gratification to be able to affirm that the information which we have this day the honour of communicating to the Association, does most thoroughly sustain his opinion. Independently, therefore, of a host of medical writers who published before the practice of vaccination commenced, we have statements from a large number of our correspondents amply confirming the same; and were our registers of vaccination and small-pox inoculation as complete as they might be, it would be found, we believe, that the prophylactic power of these affections accords much more entirely than is generally imagined. This, however, implies that vaccination has been in all respects perfect.

Before we specify events that have taken place very recently, we would refer to the epidemic which prevailed in the years 1818 and 1819. There can be no doubt that this was a disease of a variolous origin, assuming a modified form when it appeared among persons who had previously been vaccinated, or had small-pox, but taking on its true, unmitigated, and fatal form, in those who had not been so protected. It has also been ascertained by direct experiment, that inoculations with the modified virus will produce in the first degree regular vesicles, with a central depression, and a silver hue, precisely like the genuine vaccine. This character, however, was not perpetuated, for on the second inoculation the true small-pox followed. Several of our correspondents, but particularly Dr. Blackmore, of Bath, have suggested experiments to confirm this

point, but those performed by Sacco, of Milan, so completely establish it, that all doubts ought to be removed.

Now the converse of this proposition is also demonstrable in a very remarkable manner. At the commencement of the practice of vaccine inoculation, the vaccine and the variolous lymph were mingled together, and an eruptive disease of a true variolous character was the consequence. By repeated inoculations with this lymph, the disease became milder and milder, till the vaccine influence predominated, and at last the genuine solitary vesicle appeared. The accuracy of this statement is indisputable, inasmuch as genuine and fatal small-pox was propagated by contagion from this affection, before it had by repeated inoculation assumed its mild form. Here we have another proof of the analogies which subsist between the variolæ of men and of the inferior animals.

The same truths may be exemplified in another way. Thus, it is found that in persons inoculated with vaccine and variolous matter about the same period, both inoculations proceed and mutually controul each other. This even may be witnessed when the inoculations are performed not quite simultaneously, but within a few days of each other. When, however, a longer time has been permitted to elapse, this controuling power is not observed, and the vaccine or variolous disease will predominate and run its course, according as the one or the other has had the precedence in the constitution.

In Norwich, we learn from Mr. Crosse, that out of six hundred and three persons affected by that

disease, two hundred and ninety-seven had previously had small-pox, that ninety-one had been vaccinated, and that two hundred had neither had cow-pox nor small-pox. Of this latter number, forty-five perished. Of the ninety-one vaccinated persons, all, with the exception of two, had a mild affection. The same seems to have been the case with the two hundred and ninety-seven who had previously had small-pox. His correspondents, however, informed him of many secondary cases of small-pox, three of which are stated to have been fatal.

In Edinburgh, Dr. Thomson saw five hundred and fifty-seven cases. Of this number, two hundred and five had neither had small-pox nor cow-pox, forty-one had gone through the small-pox, and three hundred and ten had been vaccinated. Of the first class, fifty died; of the second, including thirty cases communicated by a friend, making in all seventy-one, three died; of the third, one is reported to have died, but it is represented as an anomalous case, not of small-pox, but of peculiarly aggravated chicken-pox. It is needless to accumulate examples of this kind, as the same results have attended every similar epidemic that has been described in different parts of Europe.

We think that the occurrences at Marseilles in 1828 bear fully on this point. At that time, there were thirty thousand persons in the town who had been vaccinated. Of these, two thousand were attacked with small-pox, and twenty-one died. Two thousand persons had previously had small-pox, of whom twenty had it a second time, and four died.

We have already given an account of the occurrences at the Orphan Asylum at Chelsea; the proportion of cases of small-pox after small-pox being decidedly greater than that of small-pox after vaccination.

The evidence drawn out by our own circulars strongly corroborates this part of our subject. The returns are occasionally vaguely expressed, many gentlemen saying that they have seen "a few cases" of small-pox after small-pox; others give distinct numbers, as three or four. According to the most accurate calculation that we can make, there cannot be fewer than two hundred and thirty-nine cases recorded by sixty-two correspondents; of these, twelve or thirteen proved fatal.

The most remarkable examples have been forwarded to us by Mr. Goolden. In his professional life of upwards of forty years, he has seen between eighty and ninety cases of "small-pox after small-pox, four of which proved fatal; many were confluent and very severe." He had heard of small-pox a third time in two families; and by reference to the parties ascertained it to be true.

If we except the fatal cases of small-pox after vaccination which are reported to have occurred in the Small-Pox Hospital in London, the deaths from small-pox after small-pox in the country correspond very nearly with the deaths from small-pox after reputed vaccination. This coincidence is more deserving of notice, when it is considered that small-pox of late years has been very much controuled, and infinitely less diffused than it was before the introduction of vaccination.

RE-VACCINATION.

The practice of re-vaccination has always been more or less adopted. It was generally recommended when the first vaccination had been imperfect, or when the fears of the parents led them to suspect that the protection was incomplete. It is only, however, within these ten years that extensive and systematic re-vaccinations have been employed in several of the Continental States.

Two opinions, somewhat opposed to each other, seem to have given rise to this practice. The one rests on the belief that after a certain period the influence imparted by vaccination, how complete soever it may have been at the commencement, gradually subsides, and leaves the person a prey to the malignant effects of small-pox contagion. This is a supposed constitutional change, totally irrespective of the quality of the virus, and cannot be obviated by any care or precaution that can be employed. The other view assumes that it is the virus itself which becomes deteriorated, and that the permanency of its effects is thereby lessened. Before we make any remark on these opinions, we shall take up an important preliminary question, and endeavour to find out whether a successful re-vaccination necessarily proves that the individual who is the subject of it, is thereby shown to have lost his vaccine protection, and, consequently, to have been liable to small-pox infection. This is a very essential point in the enquiry ; for if the affirmative is sustained by accurate investigation, it might lead to very discouraging views.

We are sorry to observe that this unfavourable opinion has been too readily adopted and diffused in England. We have been told that the partial protection is not only demonstrated by such trials, but likewise that another truth has thereby been manifested, namely, that the protection diminishes in a ratio which may be measured by the time that has elapsed from the first vaccination. We hope to make it appear that both these conclusions are erroneous. The first has, indeed, in some degree been countenanced by the assertion of Dr. Jenner, who said that "if the constitution shows an insusceptibility of the vaccine influence, it commonly does of the variolous likewise;" and he was in the habit of recommending re-vaccination, in order to ascertain whether the individual was secure from small-pox.

We suspect that this statement, accurate in the main, has led to inferences that are incorrect. We know, at least, individuals vaccinated many years ago, who, last winter, as well as on many former occasions, were exposed to small-pox contagion, and resisted it. A very short time after such exposure, they were re-vaccinated, and a complete vesicle appeared. Again, the converse is shown by a circumstance which has recently come to our knowledge. A clergyman who was vaccinated in his infancy, was, about ten months ago, re-vaccinated, and completely resisted the infection. Two months afterwards he was exposed to the contagion of small-pox, caught the disease, and had it somewhat severely. We know likewise of cases in which small-pox followed re-

vaccination ; one took place a few weeks after that process ; another is mentioned by Mr. Bailey, of Thetford. A pupil of his was vaccinated when an infant ; he attended many severe cases of small-pox, and fearful of the infection he re-vaccinated himself, and went through the disease well. Last winter, while at Guy's Hospital, he took the small-pox, had it smartly, and was obliged to leave town for the country, to recover his health.

We know another case that deserves to be noticed. A lady was vaccinated in 1806. She was re-vaccinated in 1833, and resisted the infection. In 1839 she was exposed to the influence of small-pox in a house where a child died of that disease. On this occasion she was seized with a violent incursive fever, which was succeeded by a slight variolous eruption, but it died away in a few days. It may be mentioned at the same time, that her sister, who was vaccinated in 1809, had also a slight attack of small-pox, having had about thirty pustules.

It sometimes happens after a person has had small-pox, that a local influence may be produced by every insertion of variolous matter. This fact was familiar to some of the early inoculators of small-pox, who, we have been told, were accustomed in this way to reproduce the virus on their own bodies, and thus preserve it for successive inoculations, as occasion required ; and we believe that, in like manner, a vaccine vesicle might be excited.

We find a satisfactory elucidation of these views in the work of Dr. Heim, though he adopts the notion that vaccination taking effect under any circumstances, is a proof that the individual was

susceptible of small-pox. But be this as it may, the fact we wish to insist upon is, that re-vaccination succeeds or otherwise on persons who have had small-pox or cow-pox, almost exactly in the same ratio; thus establishing another most remarkable analogy.

The proportion of one hundred cases of each description is as follows:—

Vaccinated after small-pox, with success	32
Ditto ditto modified	26
Ditto ditto without effect	42
	100

Re-vaccinated, with success	34
Ditto modified	25
Ditto without effect	41
	100

If vaccination lost its saving energy in the manner that has been imagined from the results of the re-vaccinations on the Continent, we should have had corresponding proofs in our own country. We have seen small-pox spreading very generally in towns and districts where vaccination has been performed more or less extensively for nearly forty years; and although re-vaccination has been very partially employed, such persons have perfectly resisted small-pox, which certainly could not have been the case, had the prophylactic powers of vaccination decayed, as has been asserted.

The reports from the gentlemen who have communicated with us on this branch of the subject are neither numerous nor conclusive. The experience, therefore, of this country can have little weight in

the argument. We are sorry, at the same time, to observe that the statements from the Continent are of a very contradictory nature. In Germany, thirty-seven out of one hundred re-vaccinations are said to have been successful. According to the report from the French Institute, twenty thousand out of forty-four thousand succeeded. This latter statement is at variance with the assertions of Monsieur Rochoux, who says that Monsieur Baudelocque succeeded only once in a hundred and twenty-five times, and Monsieur Geradin once in eleven times.

Mr. Hutchinson, of the Foundling Hospital, tells us that of two hundred and sixteen re-vaccinations only eleven were successful. One hundred and twenty-two were spurious, and in eighty-three cases no effect at all was produced. It is quite manifest that inferences from such conflicting statements must be extremely inaccurate. We do not pretend to decide on what has occurred in foreign countries. We will only observe, that unless better data are afforded for measuring the precise period when vaccine protection becomes extinct, than have hitherto been presented to us, we are bound to say that they ought not to be relied on. Are not all these difficulties and contrarieties likely to disappear, when it is universally understood that the vaccine disease is a true small-pox, and that both it and human small-pox are governed in their essential qualities by the same laws?

Upon the whole, we are of opinion that re-vaccination can only be required where doubts are entertained of the correctness of the first vaccina-

tion. This is also the decision of most of our correspondents who mention the subject. In reference to this point, Dr. Kendrick, of Warrington, says, "that inasmuch as cases of modified small-pox have occasionally occurred in a few weeks after well ascertained vaccination, the pratice of re-vaccination is superfluous, and in some cases may have proved injurious."

Systematic re-vaccinations appear to us uncalled for, and liable to several objections, which we will now briefly state. In the first place, the practice implies that the virtues of cow small-pox are less permanent than we believe them to be; and now that this point has been freed from all ambiguity, we are not inclined to do any thing to shake the confidence which must ultimately spring from right views of this subject. In the next place, it is probable, if re-vaccination be looked upon as essential, that less attention may be paid to the first vaccination than it demands, persons believing that all imperfections may be rectified by the subsequent operation. Now, as we are firmly convinced that incomplete vaccination has been the cause of a large proportion of failures, we cannot help dreading that defects of this kind, which it is so needful to remedy, might become more frequent than they are at present.

We might dwell at much greater length on this subject, by referring to the experiments conducted in various parts of the Continent. The authors of them take for granted an essential difference between cow-pox and small-pox. Some of their cases we have already mentioned as affording a

marked contradiction to this idea, and have brought them forward to corroborate the demonstration of the identity of the two affections, and the analogies which subsist between them.

STATE OF THE POPULATION WITH REGARD TO SMALL-POX AND VACCINATION: SUGGESTIONS FOR RESTRAINING THE FORMER AND PROMOTING THE LATTER.

Our returns on these heads are very far from being so complete as we could desire. We cannot, therefore, say what proportion of deaths has arisen from small-pox during the last year; nor are we able to give any thing like an accurate estimate of the number of children that are left unprotected by neglect of vaccination. By looking, however, at the population returns, and contrasting the former mortality from small-pox with the greatest that has been known to occur since the general adoption of vaccination, the value of that practice is rendered very apparent. In Great Britain and Ireland, between forty and fifty thousand were supposed to perish annually from small-pox; and if we take into account the vast increase of the numbers of the people, probably eighty thousand or more would now fall a prey to it, were it not controuled by the agency of this life-preserving power. In London alone, where, on an average, between two and three thousand perished annually, the deaths in 1827 amounted to only two hundred and seventy-seven; and last year, though the small-pox was peculiarly fatal, the deaths were seven hundred and eighty-eight. This certainly is a very large num-

ber, and we feel assured that it might have been much reduced by cautious and extended vaccinations.

Since the preceding remarks were written, the Registrar General of Births, Deaths, and Marriages, has kindly transmitted to us a copy of his first Annual Report. Among a great quantity of very valuable information, we find some facts which could not have been obtained from any other source. In the half-year ending on the 31st of December, 1837, one hundred and forty-one thousand six hundred and seven deaths were registered in England and Wales. Of these, five thousand eight hundred and eleven were occasioned by small-pox. The disease was epidemic, particularly in Liverpool, Bath, and Exeter. Of one thousand and fifty-six deaths registered in Bath, Liverpool, Exeter, parts of Shropshire, Worcestershire, and the Metropolis, eight hundred and eighty-seven occurred under the age of four years; ninety-nine between five and nine; fifteen between ten and fourteen; eighteen between fifteen and nineteen; twenty-nine between twenty and twenty-nine; five between thirty and thirty-nine; two between forty and forty-nine; one between fifty and fifty-nine. This specification, it is added, may be considered as an approximation to the ages of the five thousand eight hundred and eleven; and it is inferred that the majority of this number had never been vaccinated, as so large a proportion of deaths occurred among the very young; and it is known that the poorer classes, if they do not neglect vaccination altogether, often defer it for years. Our returns fully

verify this view of the question, as the number of deaths by small-pox after vaccination, recorded by all our correspondents, exclusive of those from London, is very small indeed. We have extracted from the tables an account of small-pox as it appeared in different districts, from July 1st to Dec. 31st, 1837, both inclusive. This table gives the population of each district, and shows at once the localities where the disease was most prevalent and fatal. Could we at the same time have ascertained with precision the exact number of persons vaccinated in each of the several districts, we could better have determined the connexion between the prevalence of small-pox and the neglect of vaccination.

Population of	Census of 1831.	Deaths from Small-pox.
England and Wales	13,897,187	5811
Parts of Middlesex, Surry, and Kent	1,594,890	763
Manchester and Salford	236,935	141
Liverpool and West Derby	218,233	634
Leeds	135,581	15
Birmingham	110,914	89
Middlesex (part of), Hertfordshire, Buckinghamshire, and Bedfordshire	515,893	292
Kent, Surry (part of), Sussex, Hampshire and Berkshire	1,351,236	282
Dorsetshire and Wiltshire	373,797	236
Devonshire	503,118	476
Cornwall	304,785	123
Somersetshire	415,252	310
Essex	304,315	20
Norfolk and Suffolk	682,788	64
Cambridgeshire, Huntingdonshire, and Southern parts of Lincolnshire	341,714	25
Lincolnshire (Northern parts of), Rutlandshire, Derbyshire, Nottinghamshire, Leicestershire, and Northamptonshire	1,045,133	244
Oxfordshire, Gloucestershire, Worcestershire (except Dudley), and Warwickshire (except Birmingham)	977,108	320

Population of	Census of 1831.	Deaths from Small-pox.
Mining parts of Staffordshire, Shropshire, and Worcestershire,	223,457	242
Cheshire, Shropshire, and Staffordshire, except mining districts	721,555	253
Lancashire, South of Morecambe Bay, except Liverpool and Manchester	905,501	352
West Riding of Yorkshire, except Northern part thereof, and Leeds	773,254	152
City and Ainsty of the City and East Riding of the County of York	199,515	10
Durham and North Riding of Yorkshire, with part of West Riding	319,042	22
Mining parts of Northumberland and Durham	318,941	91
Cumberland and Westmoreland, with parts of Lancashire and Northumberland	338,273	86
Wales, Monmouthshire, and Herefordshire	1,016,219	564

From these tables we learn the most distressing fact that there are only four diseases more fatal than the small-pox. Nearly six thousand perished in England and Wales in six months; and if the same rate of mortality existed in Ireland and Scotland, at least ten thousand victims might be counted within that period.

We do not learn that small-pox inoculation is habitually practised, with one or two exceptions, by any regular professional gentleman throughout the kingdom. This most gratifying fact irresistibly proclaims the unshaken confidence of the profession at large in the virtue of vaccination. We have witnessed some indications of an opposite spirit, but the unbiassed and disinterested voice of our brethren rebukes and disowns it. They admit, as we have already stated, that unlooked-for disasters have occurred, but these have not extinguished the evidence of a contrary nature, nor allowed them to hesitate respecting the inestimable value of this precious boon.

We have, however, ascertained that the destructive practice, which all respectable medical men now decline, is taken up by obscure, ignorant, and mercenary persons, who do not scruple to introduce the contagion when required to do so; and from such sources a great mortality has arisen in many districts. We have in another place expressed our opinion that the attention of the Legislature should be especially drawn to this subject, and a petition to Parliament which we are about to suggest, contains a clause directed to that object.

We find likewise that the prejudices of the poor are promoted and cherished by these avaricious and unworthy individuals. The consequence is, that vaccination is often contemned and rejected till the variolous epidemic shows itself, and when hundreds are swept away, the survivors are induced to take shelter under the vaccine shield which they had formerly despised. From the whole of our enquiries on these heads, we have come to the conclusion that small-pox inoculation is not restrained and regulated as it ought to be, nor is vaccination offered to the poor in the manner that their necessities and the safety of the community require.

According to our returns, the places in which small-pox was most prevalent last year, were Exeter, Manchester, Hereford, and Wrexham.

During the whole of this period, as we are informed by Dr. Shapter, the small-pox made extensive ravages at Exeter and in its neighbourhood, the cases in general were more than usually fatal, not less than five hundred having fallen victims to it. Nearly all these took the infection in the natural

way. A few cases are reported to have occurred after vaccination, but it is said, not more than one in twenty, and not a single death. The same gentleman ascribes many of these failures to imperfect vaccination, and he reports two cases of small-pox after small-pox. In Hereford we are told of twenty-five deaths from small-pox during the same period, but it is also mentioned that not one of the sufferers had been vaccinated. In Wrexham eighty-five deaths from small-pox were registered, but not a single death occurred after vaccination. Mr. Griffiths, who sends us this report, announces that he has seen two cases of small-pox occurring a second time, both proving fatal. Dr. Holland, of Manchester, tells us of nineteen deaths from small-pox in eight months, out of a population of about thirty thousand. Mr. Goolden, of Maidenhead, gives a return of forty-four deaths in two Unions, consisting of eight parishes; the first of which Unions, viz., Cookham, furnished twenty-eight, all accurately investigated, and not one found to have arisen after vaccination.

The cases above specified, if we except those from London, elsewhere noticed, are the most remarkable in point of numbers, many of our correspondents only mentioning one or two deaths, others stating several in general terms, but a very large proportion saying that they have seen none. We have already pointed to the Isle of Wight as an illustration of the latter truth, but perhaps a better may be drawn from the experience of several parishes in the vicinity of Cheltenham. Small-pox visits the latter town, with more or less severity, annually;

but from these parishes it has been excluded for many years. All the children are carefully vaccinated, and small-pox has been most efficiently controuled.

With regard to the general diffusion of small-pox, we would observe that this calamity is in no wise to be ascribed to the failure of vaccination. On the contrary, from the evidence before us, we may affirm that it has rather arisen from the greater prevalence of natural small-pox among the unvaccinated persons. In former times an evil of this kind was met by the seclusion of the infected subject in the workhouse or the pest house, which was for the most part followed by a general inoculation. It is not so now: small-pox has been kept at a distance,—the fears of the people have been thereby lulled,—and when it suddenly breaks out in a neighbourhood, it carries off hundreds,—the whole of the infantile poor population being in many places unprotected.

If, while an uncontrouled epidemic of this malignity is raging, more frequent examples of the modified affection after cow small-pox should occur, considering the great increase of population, and of the numbers vaccinated, these failures would not necessarily prove the diminution of the protecting power.

This leads us to the consideration of the provision made for the vaccination of the poor in the different country parts of the kingdom. In all cities or towns where infirmaries and dispensaries are established, gratuitous vaccination is offered, and a large number of private practitioners in like manner tender their services. Notwithstanding these efforts on the part of the profession, a very great proportion of poor

remain unvaccinated. We shall elsewhere suggest a remedy for this evil. Some may imagine that difficulties might arise from the unwillingness of parents to submit their children to vaccination. A large proportion of our correspondents inform us that this obstacle does not in many cases exist; and we think that when the real nature of this affection is explained, as doubtless it henceforth will be, all opposition will cease; we must at the same time admit that the prejudices are strong. At Collumpton, according to Mr. Maunder, small-pox inoculation is extensively practised, and it is difficult to get the people to submit to vaccination, they generally preferring (to use their own expression) "*the real thing*." Mr. Fox, of Cerne Abbas, tells us that, in a multitude of instances, the poor prefer paying from sixpence to two shillings per head for small-pox inoculation. His neighbourhood is visited periodically by small-pox inoculators. Last year they had a dissenting preacher, a blacksmith, a miller, and an old woman, all taking up this murderous trade; and can it be surprising that there were upwards of three hundred cases of small-pox? Yet under circumstances so unfavourable, he adds, "I have not seen many cases of small-pox after vaccination, and only four within the last year."

The establishment of a regular system of vaccination is called for on other grounds. Formerly the parish surgeon received a small remuneration for this service. In a majority of instances we believe that this laudable practice has been abandoned, some Unions allowing a reduced payment for vaccination, others including it in the wretched

annual allowance for which they bargain with their medical officer. The evil effects of this system are likely to be very severely felt; and a practice which it might be supposed every friend to humanity would be eager to promote, has actually been discountenanced; at least we are told that in one Union, namely, that of Debenham, the medical gentlemen generously performed gratuitous vaccination, "any remuneration being denied by the Poor Law Commissioners."

Both the Army and Navy of Great Britain very early partook of the benefits of vaccination, and from that period to the present time, it has been conducted with great regularity and effect. Every recruit, on joining his regiment, is carefully examined, and, unless it is satisfactorily shown that he has had either small-pox or cow-pox, he is immediately vaccinated. The same vigilance is observed both with respect to sailors and marines. In these services the appearance of the cicatrix is a good deal relied upon; and whenever it is deficient, or of an irregular character, the party is subjected to vaccination. We have been favoured with communications from Sir James M'c Gregor and Sir William Burnett, the heads of these departments. Sir William has transmitted to us a copy of a Report upon the Small-pox as it appeared in two of her majesty's ships, namely, the Phaeton and Hastings, in 1825 and in 1836. On board the Phaeton there were eighteen cases of small-pox, ten of which occurred to vaccinated, and three to unvaccinated persons; three others had neither had small-pox nor cow-pox, and two were under vaccination; out

of the whole of these, three died, one of whom had neither had small-pox nor cow-pox ; the remaining individual was under vaccination. On board the Hastings forty cases of small-pox took place. This vessel was in the Tagus. Thirty-seven of those affected, were vaccinated persons; three were unvaccinated. Of the whole number two died, one of whom was unvaccinated, and the other uncertain. Sir William states that this is the only ship in the navy, in which small-pox has recently appeared. When we consider how often, in former times, our fleets and armies were disabled by this dreadful pestilence, we cannot but feel satisfaction on knowing that it has been entirely controuled by Jenner's discovery. The late Duke of York, very soon after its promulgation, issued that order for the vaccination of the army which is still in force; and, a very short time afterwards, a similar mandate proceeded from Earl Spencer, the first Lord of the Admiralty, at the suggestion of the late Sir Gilbert Blane. It ought also to be remembered, that the medical officers of the navy most generously marked their value of the new practice, by directing a gold medal to be struck, commemorative of that event, which was presented to Jenner in the year 1801.

The returns from the surgeons of the marines stationed at Woolwich, Chatham, Portsmouth, and Plymouth, require a short notice. At Woolwich, we learn from Mr. Parkin, that from 1822 to 1838, inclusive, five hundred and seventeen persons were vaccinated. In that period the number of cases of small-pox after vaccination appears to have averaged

about three in two years. At Chatham, Mr. Rae mentions that from 1817 to 1838, one thousand eight hundred and eighty-nine had received vaccination. In that period seventy-one cases of small-pox had taken place; of these, very few were after vaccination, and they were generally of a modified nature. At Plymouth, according to Mr. Ryall, two thousand one hundred and ninety-three were vaccinated from 1827 to 1838; he mentions a very few cases of small-pox after vaccination, but the proportion is unknown. Mr. Quarrier, of Portsmouth, reports that three hundred have been vaccinated in each year from 1831 to 1837; but in the year 1837–1838, owing to the prevalence of small-pox, four hundred were vaccinated. No cases of small-pox after vaccination happened among their own vaccinated men, women, or children; but some occurred where the mark appeared satisfactory upon enlistment, but much modified.

The state of small-pox and vaccination in several countries of the Continent to which we shall now briefly advert, will tend to strengthen the suggestions that we mean to offer respecting the management of the practice in England.

In a very valuable paper, published by M. Hoffman, Director of the Statistical Bureau of Berlin, comprising an account of the births and deaths in the Prussian States, from the year 1820 to the year 1834, we have some interesting information. The bills of mortality contain a separate entry of the deaths which have arisen from small-pox. It is asserted, however, that these entries have been very inaccurate, many deaths which arose from other

cutaneous diseases having been attributed to small-pox. The table given by Hoffman, though in this respect incorrect, serves, however, as an indication of the limits beyond which the fatal effects of this malady do not extend. On an average, he observes, there were in one million of deaths, even according to this table, only eight thousand one hundred and ninety-one caused by the small-pox, i.e., one in one hundred and twenty-two; and it is very probable that the correct number was considerably less. The last three years present an increase in the numbers. On an average, in one million of the whole deaths, there died of small-pox—

Between the years	1820–22	6,152
.....	1823–25	6,216
.....	1826–28	6,774
... .	1829–31	5,763
.....	1832–34	14,791

M. Hoffman nowhere intimates that this increase of mortality from small-pox arose from any failure in the powers of vaccination, not one fatal case after vaccination being recorded; we are entitled, therefore, to infer that the mortality was among those who had neither had small-pox nor cow-pox. From the above table it appears that even in these last three years, the small-pox occasioned only one in sixty-eight of the aggregate deaths. He then adds, the destructive agency of this contagion, which once occasioned such devastation, is now, then, even in the period of its greatest prevalence, exceedingly diminished.

Mr. Dodd, one of the Secretaries, before the appointment of the Section, sent several questions

to Doctor Otto of Copenhagen, Doctor Hecker of Berlin, and Doctor Holst of Christiana in Norway. The object of these questions was to ascertain the methods enforced by the governments of these countries for diffusing the practice of vaccination among their people, and likewise the estimation in which the practice is held.

In Denmark, vaccination is performed gratuitously by the parish surgeons and physicians; but in Copenhagen, an institution is supported by the King, the physician receiving a salary, and being required to keep up a supply of lymph for the provinces. The practice of vaccination is enforced by law, as no person can be confirmed or marry without a certificate of its having been undergone. The system is very complete in this country, and has been steadily acted upon from the beginning. The strictest registration of all vaccinated persons is maintained, and the rules for the operation, as well as correct representations of the genuine vesicle, are universally diffused. The practice is now confined entirely to medical men; formerly midwives and others were permitted to interfere with it. Inoculation with the small-pox is entirely prohibited. Doctor Otto farther states that vaccination is considered to afford protection for a period, varying from five to eight years; that re-vaccination has become frequent, and that as yet there have been no instances of re-vaccinated persons becoming infected with the small-pox. The lymph employed, until two years ago, was that received from Doctor Jenner in 1800. Nothing is said of this lymph having become deteriorated. In 1835 a fresh supply was obtained from a cow in Holstein.

In Prussia the most effective provisions have likewise been adopted by Government. The largest institution for vaccination is in Berlin; it is under the direction of Doctor Bremer, who has a salary; he vaccinates all who come, gratuitously; and supplies lymph to any medical man in the kingdom who requires it of him. There is a similar institution at Breslau. In the country a very complete system has likewise been enforced. The whole kingdom is divided into governments, and each government into circles or districts. Each district has a judge or state councillor, who is necessarily well informed respecting the population and local affairs; and with him the district doctor is associated as medical commissioner. Each district is sub-divided; to each sub-division a vaccinator is appointed. Days are fixed when parents and their children ready to be vaccinated, who are known by reference to the population lists, are required to attend. The vaccinator keeps a journal, re-examines at proper times, and makes out official returns, which are sent to the government at Berlin. All other medical men give in a list of their vaccinations to the district doctor.

None but licensed practitioners are permitted to vaccinate, and these gentlemen are required to show, in their public examinations, that they are well acquainted with the practice. Small-pox inoculation is unconditionally and strictly forbidden. Doctor Hecker further observes, that vaccination, notwithstanding the recent appearance of the varioloid epidemics, every where obtains unbounded confidence, and whenever the small-pox shows itself,

re-vaccination is adopted. All recruits, without exception, are re-vaccinated on entering the army; and a third part of the whole army once every year. Since this has been done, small-pox has been unknown among the soldiers. The lymph has been occasionally renewed when an opportunity offered; but as the disease is rare among cows in Prussia, such opportunities are not of frequent occurrence. The general opinion is, however, that the lymph from the cow acts more intensely than that which has been long in use.

The information conveyed by Dr. Holst respecting the state of vaccination in Norway, corresponds very much with that delivered above. In 1800, a royal ordinance was issued, commanding all medical men to endeavour to diffuse the practice of vaccination. Midwives and other properly instructed persons were also authorised to perform it. Re-vaccination is not yet ordained by law, but it has (especially during epidemics of variola,) been frequently used, and apparently with good effect. Inoculation for small-pox is strictly forbidden: a medical man convicted of following this practice, loses his right to exercise his profession; and if he is a public officer, forfeits his situation. Dr. Holst concludes by saying that, although many vaccinated persons have been attacked by small-pox or the varioloid during the last fifteen or sixteen years, the medical men of Norway, as well as the public at large, highly estimate vaccination as prophylactic in the majority of instances, and modifying and mitigating in others. It is farther said that the vaccine virus is renewed every year, the cows in those districts where the disease prevails

in different parts of Europe supplying them with fresh lymph.

We have very recently received a letter from Dr. Gregory, at Paris, giving us a sketch of the state of vaccination in France. We will mention two or three of the most interesting particulars, regretting that the limits of this report will not permit us to do more. He calculates that not more than from fifteen hundred to two thousand are vaccinated yearly at the Central Station at Paris. There is a medical officer attached to each of the twelve arrondissements, whose business it is to vaccinate the poor. Monsieur Bousquet, the Superintendant Vaccinator, calculates that ninety per cent of the children born in Paris, are vaccinated; but the proportion in the provinces is thought to be not more than twenty-five per cent. Vaccine capillary tubes are employed, which Dr. Gregory thinks a great improvement on the English practice. The lymph employed is chiefly that obtained from the cow at Passy, a village in the vicinity of Paris. Some of the original matter supplied by Doctor Woodville is also in use.

It will be manifest from all that we have said, that England has by no means reaped the benefit that might be derived from a more perfect system of vaccination than has yet been practised. There are two measures arising out of this enquiry, which we think the Association might with great propriety recommend to the attention of the legislature.

The first regards the regulation of the practice of small-pox inoculation.

The second points exclusively to the diffusion of correct vaccination in every district of the kingdom.

On each of these heads we shall offer a few remarks, which will show that the plan we propose is easy of execution, and may be made the subject of legislation without in any degree interfering with prejudices which still unhappily stand in the way of more positive enactments.

It is well known that the exposure of a person labouring under a contagious disease is at present an offence at common law, and punishable by fine and imprisonment. Several convictions have of late years been obtained in consequence of the violation of this law by persons affected with small-pox; but the actual practice of small-pox inoculation does not incur any punishment, though it certainly ought to do so. Now, it has been shown that the diffusion of small-pox epidemically in many districts, may be distinctly traced to individuals not connected with our profession, who have taken up the small-pox lancet, reckless of the consequences, and have thus disseminated the contagion to a most alarming extent. Such persons, we think, ought to be restrained. We therefore propose that the legislature should be petitioned again to declare that individuals labouring under small-pox shall not, under any circumstances, be exposed in such manner as to lead to the dissemination of the disease; and, moreover, that none but a regularly educated medical man be permitted to inoculate for small-pox, and that he likewise shall be liable to all the penalties which may attach to the infringement of the statute touching the incautious exposure of persons labouring under the disease.

If such enactments were passed, they would certainly very much diminish the diffusion of small-pox by inoculation ; they would impose no unnecessary restraint upon individuals; and, it might be thought, would meet with no opposition from the legislature.

To render the benefits derivable from them complete, some measures for the more perfect practice and diffusion of vaccination are loudly called for. We would, therefore, recommend that epizootic diseases, and the history and character of the *variolæ vaccinæ,* should be made subjects of particular instruction and investigation in every school of medicine throughout the kingdom ; and that candidates for degrees in medicine and surgery should be specially examined in this branch of professional knowledge, and that they should likewise have opportunities of practically witnessing and understanding all the instructions they may receive from their teachers. How much soever this branch of professional education may have been neglected, we are called upon to declare that there is no one more interesting, whether considered in its historical and literary character, or in the far more momentous influence which it has upon the lives of mankind.

Should these objects be attained, we would propose that duly qualified vaccinators should be appointed for every district in the kingdom, whose main duty should be, at certain seasons, to offer gratuitous vaccination to the poor of every hamlet and village or parish within their respective bounds. The stations and days and hours for vaccination might be fixed, and also the times for inspecting the progress of the affection. Registers, accurately

constructed, would show every circumstance connected with perfect or imperfect vaccination, which could always be referred to on any future occasion when small-pox made its appearance in the neighbourhood. In this manner the qualities of the *variolæ vaccinæ* would be ascertained in a manner more accurate than they have hitherto been; there would be some security for regular and efficient practice; and we should then know in how many cases and at what period it lost its protecting power.

Another duty of considerable moment might easily be attached to the offices of these public vaccinators. Living in rural districts, and instructed in the diseases of the inferior animals, they might take advantage of the appearance of the *variolæ*, either among cows or horses, and procure fresh supplies of lymph when such should be required; or they might perform such experiments as have been successfully conducted by Mr. Ceely for the renewal of the disease. With a set of well-appointed officers of this kind, small-pox could never long prevail in any district. We have found that when it shows itself in a formidable way, individuals, formerly averse to vaccination, gladly avail themselves of its protection. At such times a competent and skilful vaccinator who would offer his gratuitous services, and prove their value by manifesting the unquestionable powers of that practice, would be hailed as a deliverer.

It is not without good cause that we offer these suggestions. We have very strong statements from many of our correspondents respecting the unprotected state of the poor, especially since the new

poor-law came into operation. The Association is too well acquainted with the bearing of that statute upon the medical relief provided for the pauper, to require us to dwell upon any other part of the subject than that which we have immediately in hand. Formerly a moderate and just allowance was made to the parish surgeon for vaccination. In many cases that allowance is either withheld entirely, or so much diminished in value as to cause a very unfortunate neglect of this salutary practice. One gentleman in Cambridgeshire tells us that he had practised thirty-eight years. He seldom passed two years without vaccinating the whole parish: the consequence was, that small-pox was scarcely known, and the mortality as trifling perhaps as in any other place of its size in England. The Guardians of the Poor now only allow an insufficient remuneration, and he therefore infers that vaccination will be neglected, and that should small-pox appear in such districts, he significantly adds, the cost of coffins alone will be a heavier charge upon the parishes than would have been incurred by paying a proper remuneration to the surgeon for averting this calamity by vaccine inoculation. Dr. Jenner himself found this very argument (viz., the cost of coffins,) influential in driving certain parishes in the neighbourhood of Cheltenham to seek for vaccination. We have another illustration of the evil effects of the system to which we have alluded, communicated to us by Dr. Davis, of Presteign. When the small-pox broke out in that town last autumn, it was found that the whole of the poor population under nine or ten years of age were

entirely unprotected. This cannot of course be entirely ascribed to the new poor-laws; they must bear the blame merely for the time they have been in operation. In either case our argument is made good, namely, that it is the duty of the State to provide for the more efficient vaccination of the poor.

Another of our correspondents, Dr. Lynn, of Woodbridge, is so fully impressed with this view of the subject, that he concludes his report by observing that if medical gentlemen were properly remunerated for vaccinating the poor, we should, at the end of twelve months, seldom hear of a case of small-pox. What has been just advanced is applicable to every district in the kingdom. We know of instances in which private liberality supplies the place of public duty. There the parishes are systematically and regularly vaccinated, and the result is that small-pox is unknown.

From the character of the preceding remarks, it must be apparent that our brethren have not left us in doubt concerning their opinions of the virtues of vaccination. At the commencement of our investigation we were not without apprehension that the replies might prove less favourable than we have found them. Nothing in our own experience justified this fear, but rumours, loud and widely diffused, caused us to look for much more painful results than we have encountered. The general prevalence of small-pox in any district, has been too often supposed to indicate a decay in the protecting influence of vaccination. This idea, too easily taken up, and injudiciously propagated, has tended to confirm the prejudices which we hope may be removed.

We believe that in every situation where small-pox has recently existed in an alarming degree, vaccination has been neglected. Probably no city in Europe suffered more from this scourge than Glasgow. Before the introduction of vaccination, it is calculated that it caused one in three of the deaths under ten years of age. Immediately after the general employment of cow-pox inoculation, the mortality became comparatively trifling. During the years 1835 and 1836, there was a very great increase of deaths from small-pox. Doctor Cowan, from whose work these particulars are extracted, affirms that this increase is not to be attributed to the failure of vaccination, but to the neglect of it.

During the year 1836, he treated ninety-six cases in the hospital. Twenty-six were fatal; but no death occurred in any individual who presented the appearance of having been properly vaccinated. Another fact demands our attention. On an average thirty per cent of the admissions into the hospital consisted of Irish, but of ninety-six cases of small-pox, only four took place among that people: when we consider their poverty and their habits of life, existing in the middle of a pestilential atmosphere as they must have done, this immunity is the more remarkable, and is ascribed by Dr. Cowan to the efficient system of vaccination carried on by the surgeons of the county and other dispensaries in Ireland.

We have introduced this incident in this place for the purpose of proving by a strong contrast what we believe will universally be found to be the

case, namely, that when failures are very common, the fault lies not in vaccination itself, but in the manner of conducting the practice. In this particular a very large majority of our correspondents concur. "There is but one opinion, that properly performed it is a most powerful preservative."—"When perfect it is an unlimited protection."—"It is as good a security as small-pox inoculation."—"Confidence is as high as ever."—"Unshaken."—"Increased confidence."—"It is highly thought of by all classes."—"Carefully performed and watched it is an admirable protection."—"No diminution of confidence to any extent, either public or professional."—"Confidence unbounded and unshaken." Such are a few of the replies with which our enquiries have been greeted by gentlemen of longest standing in the profession, some of whom have been in practice for half a century. It is true that others of our correspondents have told us that their confidence is shaken; one says that "he has none;" another that "he has nearly lost it;" and a third "that he is puzzled."

We cite these in obedience to the principle laid down in the outset of our Report, but we have great pleasure in being able to state that they are infinitely outweighed by the great mass of testimony of an opposite nature.

The investigation in which we have been engaged, has brought before us every question connected either with the theory or practice of vaccination. The history of the discovery, the doctrines of the discoverer, and the directions which he delivered

for the successful diffusion of the practice, have all in turn occupied our attention. We have likewise been called upon to compare these doctrines and these directions with the experience of later times; and what has been the result? a firm and well founded conviction of the accuracy of the investigations of Dr. Jenner, and an increased reliance on the soundness of his principles, and the matchless skill and perseverance which enabled him to publish his enquiry in a state of completeness and efficiency, unexampled in the case of any preceding professional investigation. In no instance have his opinions been successfully combated; and his very conjectures, like some of the bright anticipations of other illustrious men, have been stamped with the permanent characters of scientific truth. The name he gave the disease, which was the subject of his anxious research, affords one illustration of this remark. The term *variolæ vaccinæ*, as we remarked at the outset, involves in its meaning the entire theory of its prophylactic power, as well as of its medical and literary history. The latter part of the subject has now received ample confirmation, and when the whole is duly weighed, as doubtless now it will be, it will show that his expectations of permanent benefit from the substitution of a mild for a malignant disease rested on an imperishable basis. Again, his opinion that the horse was an animal liable to an affection similar in its protecting power to that derived from the cow, though at first treated as a wild and crude imagination, has at length come forth with all the strength of demonstration.

We have now to say a few words on the wisdom which dictated his directions for the propagation of the disease. Considering the newness of the subject, and the extraordinary results that were anticipated, contradictions and obscurities might have marked the infancy of the practice. But it was not so in the present instance. The character of the vesicle, its first appearance, its subsequent progress, its deviations from a healthy condition, the aspect of the areola, the purity of the lymph, and the time and manner of its insertion so as to secure the perfect development of the affection, these, and all other particulars connected with the successful employment of this life-preserving agent, were deduced from his matured and well digested investigations with a degree of precision and perfection from which future observations have taken nothing away, and to which they have added but little.

We think it right not to allow this opportunity to escape without insisting upon these points. We do it not merely for the purpose of eulogizing Jenner, but because they are intimately connected with every part of our labours; and almost all the suggestions which we have delivered, necessarily carry us back to that patient, and wise, and enlightened mind from which the practice arose.

It well becomes us, therefore, emphatically to mark these things. Jenner, during his life-time, had a hard measure dealt out to him. His whole existence was one continued struggle to uphold and disseminate what he felt and knew to be truth; and it is unquestionable that most of the anomalies and difficulties which have marred and obscured the

practice of vaccination, may be traced to the errors of those who distrusted his doctrines, and disregarded his precepts. We rejoice to have such an occasion as the present to express this our deliberate conviction, and to declare in the face of this Association how thankfully and gratefully we offer this tribute to the genius and virtue of so great a benefactor of his race.

JOHN BARON, M.D.,
Chairman.

Cheltenham,
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